

**5.11.2.8 Zoo Road**

Annual average daily traffic is **15209** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. LCV vehicles were present in small number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-51.

*Table 5-51 Average Daily Traffic & Annual Average Daily Traffic on Zoo Road*

Vehicle Types	ADT	AADT
Car/Jeep/Van	6614	6782
2-wheeler	7373	7653
3-wheeler	888	936
Minibus	0	0
Standard Bus	130	153
3-wheeler (Goods)	0	0
LCV	654	672
2 Axle	10	23
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	102	129
Cycle	139	163
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>15910</b>	<b>16511</b>
<b>Total (PCU)</b>	<b>14625</b>	<b>15209</b>

*(Source: Compiled by Consultant)***5.11.2.8.1 Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-52.

*Table 5-52 Directional Distribution of Traffic on Zoo Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Ganeshguri to Chandmari: Chandmari to Ganeshguri	Ganeshguri to Chandmari: Chandmari to Ganeshguri
Ganeshguri to Chandmari	50:50	50:50

*(Source: Compiled by Consultant)*

### 5.11.2.8.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-42. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 46% and 41% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 4% of traffic.

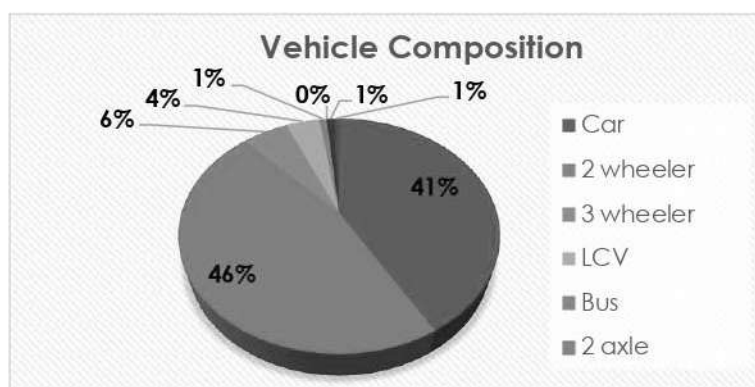


Figure 5-42 Composition of Traffic on Zoo Road

(Source: Compiled by Consultant)

### 5.11.2.8.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Zoo Road as shown in Figure 5-43

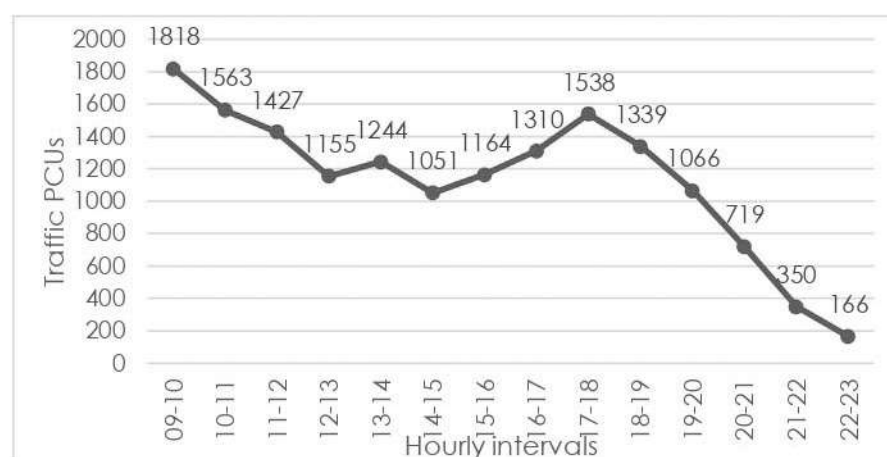


Figure 5-43 Hourly Variation of traffic at Zoo Road

(Source: Compiled by Consultant)

### 5.11.2.8.4 Peak Hour Traffic

Peak hour was found to be from 09:00 to 10:00 HRS. Total peak hour traffic is 1818 in PCU which is 11.4% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-53

Table 5-53 Peak hour traffic on Zoo Road

PCU/hr	Peak Hours	Peak Hour Factor
1818	09:00 to 10:00	11.4%

### 5.11.2.9 Maniram Dewan Road

Annual average daily traffic is **22740** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type are presented in Table 5-54.

Table 5-54 Average Daily Traffic & Annual Average Daily Traffic on Maniram Dewan Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	7358	7827
2-wheeler	9188	9976
3-wheeler	824	943
Minibus	0	0
Standard Bus	624	754
3-wheeler (Goods)	0	0
LCV	3028	3267
2 Axle	3	9
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	70	94
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>21095</b>	<b>22870</b>
<b>Total (PCU)</b>	<b>20891</b>	<b>22740</b>

(Source: Compiled by Consultant)

#### 5.11.2.9.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-55.

Table 5-55 Directional Distribution of Traffic on Maniram Dewan Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Narengi to Chandmari: Chandmari to Narengi	Narengi to Chandmari: Chandmari to Narengi
Narengi to Chandmari	66:34	66:34

(Source: Compiled by Consultant)

### 5.11.2.9.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-44. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 43% and 40% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 10% of traffic.

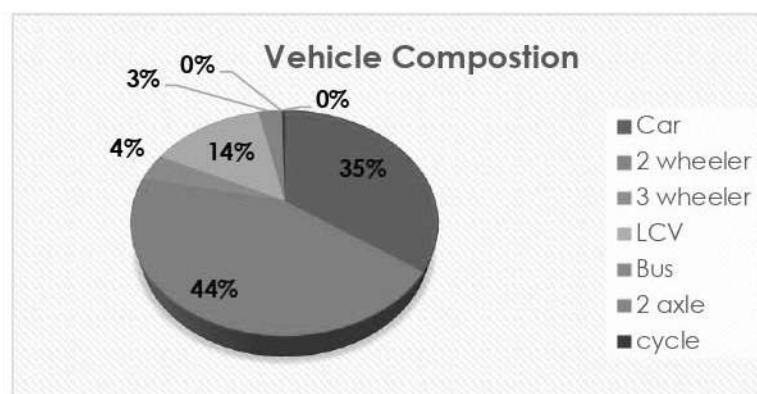


Figure 5-44 Composition of Traffic on Maniram Deewan Road

(Source: Compiled by Consultant)

### 5.11.2.9.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Maniram Deewan Road as shown in Figure 5-45.

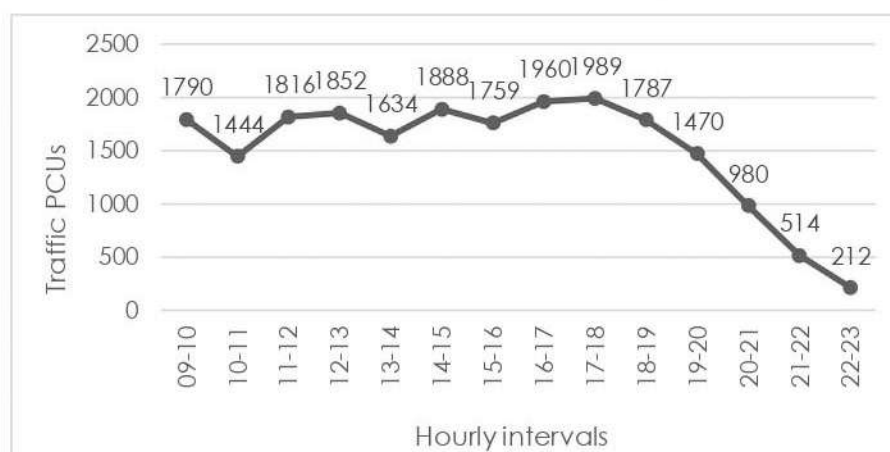


Figure 5-45 Hourly Variation of traffic at Maniram Dewan Road

(Source: Compiled by Consultant)

### 5.11.2.9.4 Peak Hour Traffic

Peak hour was found to be from 17:00 to 18:00 HRS. Total peak hour traffic is 1989 in PCU which is 9.4% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-56.

Table 5-56 Peak hour traffic on Maniram Dewan Road

PCU/hr	Peak Hours	Peak Hour Factor
1989	17:00 to 18:00	9.4%



**5.11.2.10 MG Road**

Annual average daily traffic is 102139 PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-57.

*Table 5-57 Average Daily Traffic & Annual Average Daily Traffic on MG road road*

Vehicle Types	ADT	AADT
Car/Jeep/Van	24135	45372
2-wheeler	28120	29648
3-wheeler	9728	10623
Minibus	0	0
Standard Bus	2540	2843
3-wheeler (Goods)	0	0
LCV	9161	10281
2 Axle	222	384
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	435	582
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>74341</b>	<b>99733</b>
<b>Total (PCU)</b>	<b>76018</b>	<b>102139</b>

(Source: Compiled by Consultant)

**5.11.2.10.1 Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-58.

*Table 5-58 Directional Distribution of Traffic on MG Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Bharalumukh to Kachari: Kachari to Bharalumukh	Bharalumukh to Kachari: Kachari to Bharalumukh
<b>MG Road</b>	93:7	94:6

(Source: Compiled by Consultant)

### 5.11.2.10.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-46. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 38% and 33% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 12% of traffic.

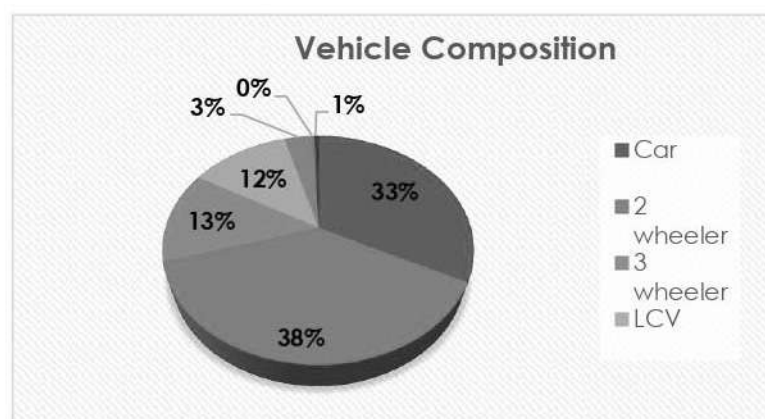


Figure 5-46 Composition of Traffic on MG Road

(Source: Compiled by Consultant)

### 5.11.2.10.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at MG Road as shown in Figure 5-47.

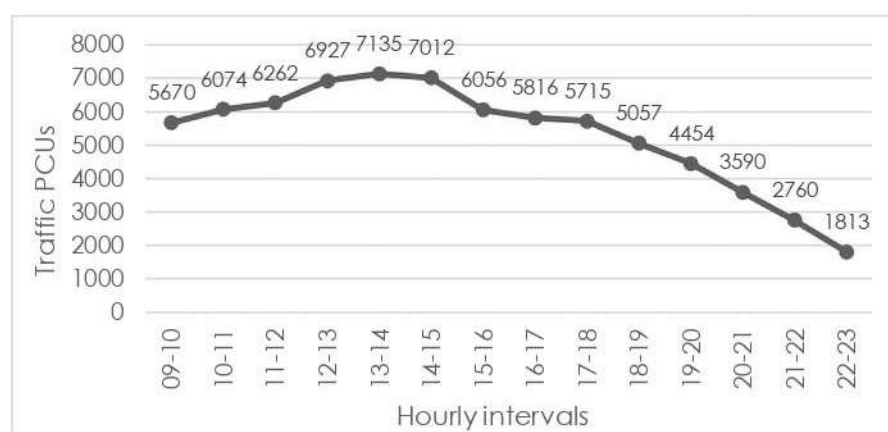


Figure 5-47 Hourly Variation of traffic at MG road

(Source: Compiled by Consultant)

### 5.11.2.10.4 Peak Hour Traffic

Peak hour was found to be from 13:00 to 14:00 HRS. Total peak hour traffic is 7135 in PCU which is 9.5% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-59.

Table 5-59 Peak hour traffic on MG Road

PCU/hr	Peak Hours	Peak Hour Factor
7135	13:00 to 14:00	9.5%

**5.11.2.11 Dr. B. Borooah Road**

Annual average daily traffic is **36102** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-60.

*Table 5-60 Average Daily Traffic & Annual Average Daily Traffic on Dr.B. Boorah road*

Vehicle Types	ADT	AADT
Car/Jeep/Van	7494	14582
2-wheeler	9856	19126
3-wheeler	995	1994
Minibus	0	0
Standard Bus	83	175
3-wheeler (Goods)	0	0
LCV	1472	2934
2 Axle	58	73
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	217	259
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>20175</b>	<b>39143</b>
<b>Total (PCU)</b>	<b>18560</b>	<b>36102</b>

*(Source: Compiled by Consultant)***5.11.2.11.1 Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-61.

*Table 5-61 Directional Distribution of Traffic on Dr. B. Boorah Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	GHY Club to Ulubari: Ulubari to GHY Club	GHY Club to Ulubari: Ulubari to GHY Club
GHY Club to Ulubari	76:24	76:24

*(Source: Compiled by Consultant)*

### 5.11.2.11.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-48. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 49% and 37% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 7% of traffic.

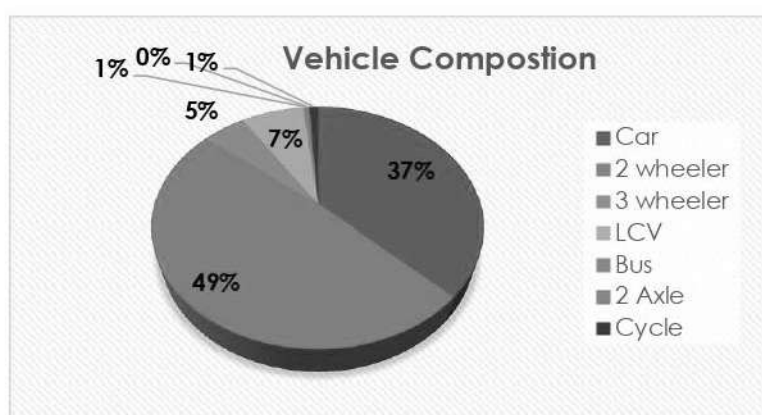


Figure 5-48 Composition of Traffic on Dr. B. Boorah Road

(Source: Compiled by Consultant)

### 5.11.2.11.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at GHY Club to Ulubari Road as shown in Figure 5-49

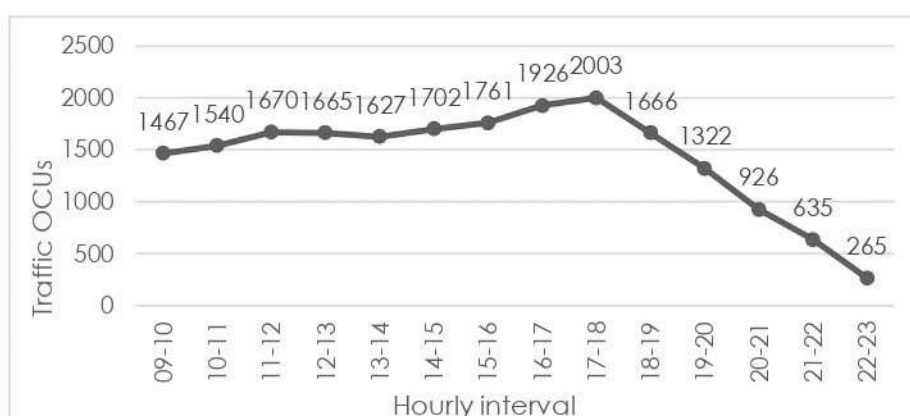


Figure 5-49 Hourly Variation of traffic at Dr. B. Boorah Road

(Source: Compiled by Consultant)

### 5.11.2.11.4 Peak Hour Traffic

Peak hour was found to be from 17:00 to 18:00 HRS. Total peak hour traffic is 2003 in PCU which is 9.9% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-62.

Table 5-62 Peak hour traffic on Dr. B. Boorah Road

PCU/hr	Peak Hours	Peak Hour Factor
2003	17:00 to 18:00	9.9%

### 5.11.2.12 Dr. BK Kakati Road

Annual average daily traffic is 13844 PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-63.

Table 5-63 Average Daily Traffic & Annual Average Daily Traffic on Dr. BK Kakati Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	3233	3421
2-wheeler	6765	6824
3-wheeler	1568	1786
Minibus	0	0
Standard Bus	15	32
3-wheeler (Goods)	0	0
LCV	1435	1532
2 Axle	25	0
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Tractor	0	0
Cycle rikshaw	522	538
Cycle	586	602
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>14149</b>	<b>14735</b>
<b>Total (PCU)</b>	<b>13205</b>	<b>13844</b>

(Source: Compiled by Consultant)

#### 5.11.2.12.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-64.

Table 5-64 Directional Distribution of Traffic on Dr. BK Kakati Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Bhangagarh to Fatasil Ambari: Fatasil Ambari to Bhangagarh	Bhangagarh to Fatasil Ambari: Fatasil Ambari to Bhangagarh
Bhangagarh to Fatasil Ambari	68:32	69:31

(Source: Compiled by Consultant)

### 5.11.2.12.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-50. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 43% and 40% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 10% of traffic.

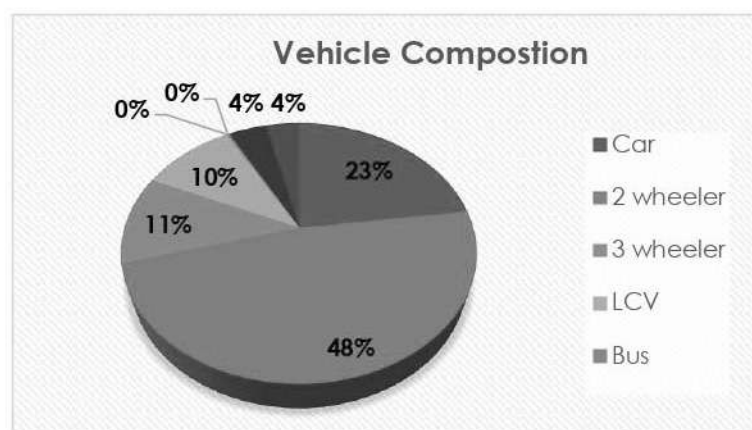


Figure 5-50 Composition of Traffic on Dr. BK Kakati Road

(Source: Compiled by Consultant)

### 5.11.2.12.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Bhangagarh to Fatasil Ambari Road as shown in Figure 5-51.

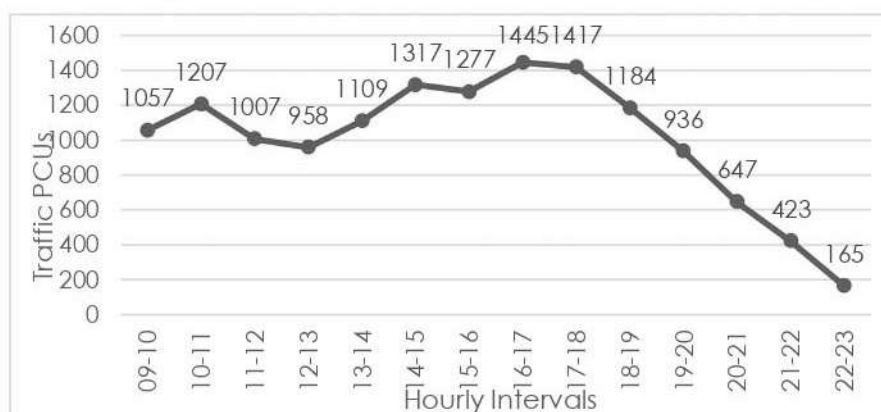


Figure 5-51 Hourly Variation of traffic at Dr. BK Kakati Road

(Source: Compiled by Consultant)

### 5.11.2.12.4 Peak Hour Traffic

Peak hour was found to be from 16:00 to 17:00 HRS. Total peak hour traffic is 1445 in PCU which is 10.2% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-65.

Table 5-65 Peak hour traffic on Dr. BK Kakati Road

PCU/hr	Peak Hours	Peak Hour Factor
1445	16:00 to 17:00	10.2%

### 5.11.2.13 Paltan Bazaar

Annual average daily traffic is **14284** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in low volume. LCV vehicles were present in small number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-66.

Table 5-66 Average Daily Traffic & Annual Average Daily Traffic on Paltan Bazaar Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	6073	6153
2-wheeler	6794	6842
3-wheeler	1007	1284
Minibus	0	0
Standard Bus	182	205
3-wheeler (Goods)	0	0
LCV	16	24
2 Axle	0	0
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Tractor	0	0
Cycle rikshaw	0	0
Cycle	361	383
Other (hand cart)	157	261
<b>Total (Nos)</b>	<b>14590</b>	<b>15152</b>
<b>Total (PCU)</b>	<b>13451</b>	<b>14284</b>

(Source: Compiled by Consultant)

#### 5.11.2.13.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-67.

Table 5-67 Directional Distribution of Traffic on Paltan Bazaar Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Paltan Bazaar police station to Athgaon: Athgaon to Paltan bazaar police station	Paltan Bazaar police station to Athgaon: Athgaon to Paltan bazaar police station
<b>Paltan Bazaar</b>	51:49	51:49

(Source: Compiled by Consultant)

### 5.11.2.13.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-52. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 42% and 47% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 7% of traffic.

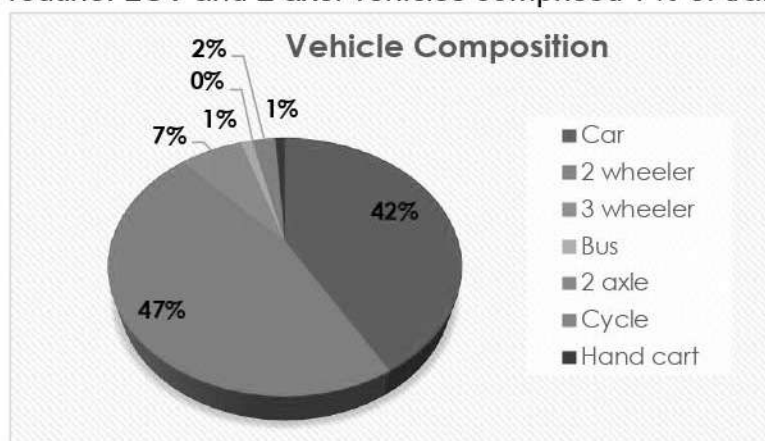


Figure 5-52 Composition of Traffic on Paltan Bazaar Road

(Source: Compiled by Consultant)

### 5.11.2.13.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Paltan Bazaar Road as shown in Figure 5-53.

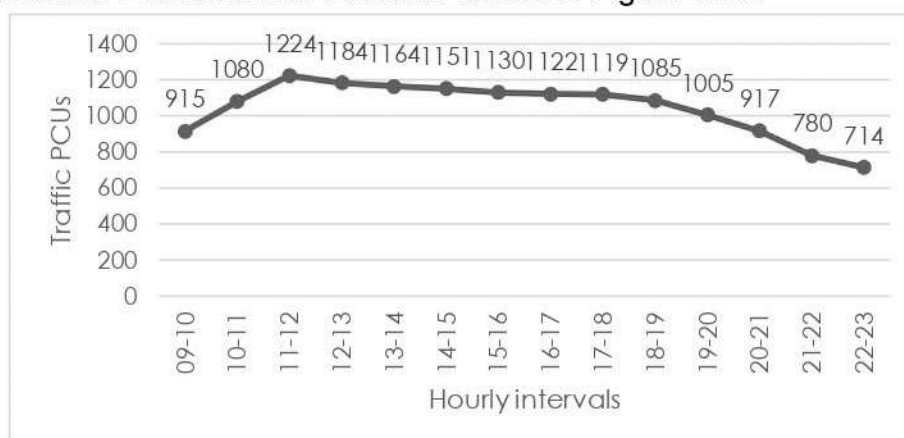


Figure 5-53 Hourly Variation of traffic at Paltan Bazaar Road

(Source: Compiled by Consultant)

### 5.11.2.13.4 Peak Hour Traffic

Peak hour was found to be from 11:00 to 12:00 HRS. Total peak hour traffic is 1224 in PCU which is 8.3% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-68.

Table 5-68 Peak hour traffic on Paltan Bazaar Road

PCU/hr	Peak Hours	Peak Hour Factor
1224	11:00 to 12:00	8.3%



**5.11.2.14 Mahapurush Madabhdev path**

Annual average daily traffic is **12232** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in low volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-69.

*Table 5-69 Average Daily Traffic & Annual Average Daily Traffic on Mahapurush Mahabhdev Path*

Vehicle Types	ADT	AADT
Car/Jeep/Van	4230	4432
2-wheeler	3813	3972
3-wheeler	514	621
Minibus	0	0
Standard Bus	428	472
3-wheeler (Goods)	0	0
LCV	1840	1979
2 Axle	61	83
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	133	169
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>11019</b>	<b>11728</b>
<b>Total (PCU)</b>	<b>11425</b>	<b>12232</b>

*(Source: Compiled by Consultant)***5.11.2.14.1 Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-70.

*Table 5-70 Directional Distribution of Traffic on Mahapurush Madabhdev path Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Narengi to Six miles: Six Miles to Narengi	Narengi to Six miles: Six Miles to Narengi
<b>Mahapurush Madabhdev path</b>	52:48	52:48

*(Source: Compiled by Consultant)*

#### 5.11.2.14.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-54. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 35% and 38% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 17% of traffic.

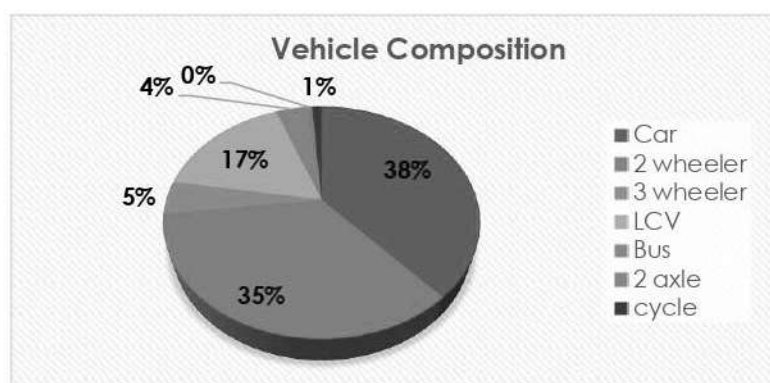


Figure 5-54 Composition of Traffic on Mahapurush Madabhdev path

(Source: Compiled by Consultant)

#### 5.11.2.14.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Mahapurush Madabhdev path as shown in Figure 5-55.

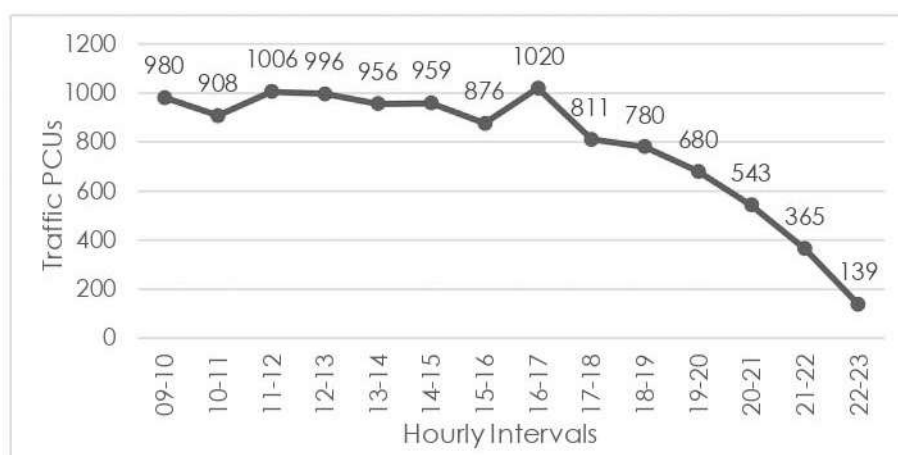


Figure 5-55 Hourly Variation of traffic at Mahapurush Madabhdev path

(Source: Compiled by Consultant)

#### 5.11.2.14.4 Peak Hour Traffic

Peak hour was found to be from 16:00 to 17:00 HRS. Total peak hour traffic is 1020 in PCU which is 9.2% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-71.

Table 5-71 Peak hour traffic on Mahapurush Madabhdev path

PCU/hr	Peak Hours	Peak Hour Factor
1020	16:00 to 17:00	9.2%

**5.11.2.15 GMCH Road**

Annual average daily traffic is 22609 PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-72.

*Table 5-72 Average Daily Traffic & Annual Average Daily Traffic on GMCH Road*

Vehicle Types	ADT	AADT
Car/Jeep/Van	8695	8754
2-wheeler	8432	8523
3-wheeler	1439	1598
Minibus	0	0
Standard Bus	27	32
3-wheeler (Goods)	0	0
LCV	3622	3754
2 Axle	62	74
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailer	0	0
Cycle rikshaw	0	0
Cycle	101	112
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>22378</b>	<b>22847</b>
<b>Total (PCU)</b>	<b>22063</b>	<b>22609</b>

(Source: Compiled by Consultant)

**5.11.2.15.1 Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-73.

*Table 5-73 Directional Distribution of Traffic on GMCH Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Sarabheti to Bhangagarh: Bhangagarh to Sarabheti	Sarabheti to Bhangagarh: Bhangagarh to Sarabheti
<b>GMCH road</b>	75:25	75:25

(Source: Compiled by Consultant)

### 5.11.2.15.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-56. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 35% and 39% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 17% of traffic.

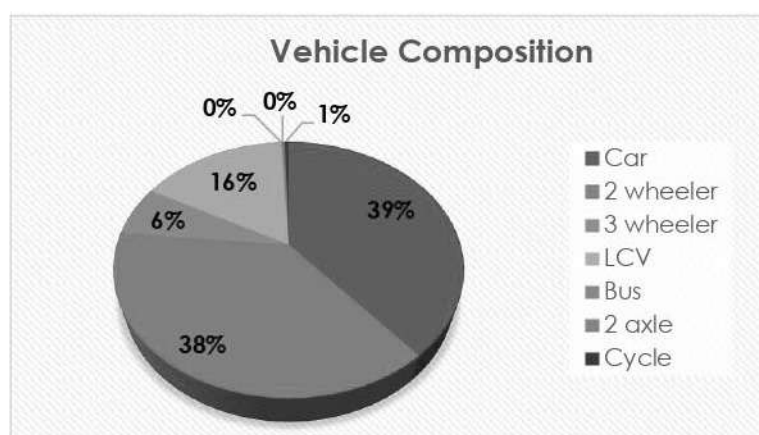


Figure 5-56 Composition of Traffic on GMCH road

(Source: Compiled by Consultant)

### 5.11.2.15.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Mahapurush Madabhdev path as shown in Figure 5-57.

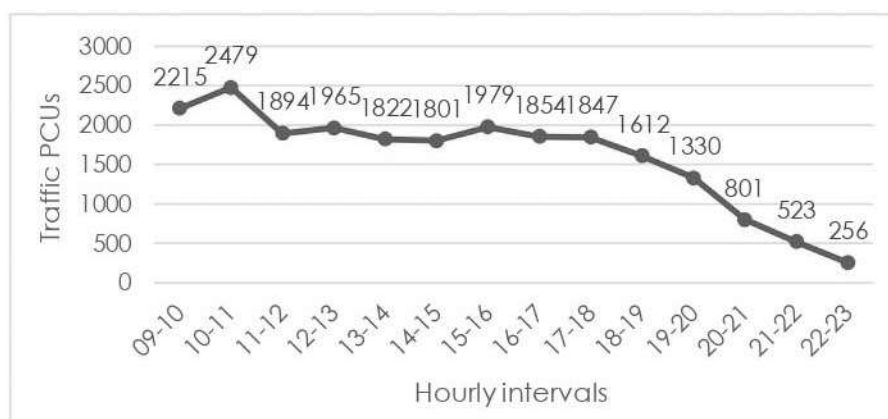


Figure 5-57 Hourly Variation of traffic at GMCH road

(Source: Compiled by Consultant)

### 5.11.2.15.4 Peak Hour Traffic

Peak hour was found to be from 10:00 to 11:00 HRS. Total peak hour traffic is 2479 in PCU which is 11% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-74.

Table 5-74 Peak hour traffic on GMCH Road

PCU/hr	Peak Hours	Peak Hour Factor
1020	10:00 to 11:00	11%

### 5.11.3 Major External roads

#### 5.11.3.1 9<sup>th</sup> Mile

Annual average daily traffic is **15143** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. LCV vehicles were present in good number while heavy goods vehicles like 2 and 3 axle were are very low in volume. ADT and AADT by vehicle type is presented in Table 5-75

Table 5-75 Average Daily Traffic & Annual Average Daily Traffic on 9<sup>th</sup> mile Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	4863	4982
2-wheeler	4113	4281
3-wheeler	1509	1683
Minibus	585	673
Standard Bus	508	612
3-wheeler (Goods)	0	0
LCV	913	1054
2 Axle	324	412
3 Axle	91	118
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	0	0
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>12906</b>	<b>13815</b>
<b>Total (PCU)</b>	<b>13886</b>	<b>15143</b>

(Source: Compiled by Consultant)

#### 5.11.3.1.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-76.

Table 5-76 Directional Distribution of Traffic on 9<sup>th</sup> Mile Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	GHY City to NGN: NGN to GHY City	GHY City to NGN: NGN to GHY City
9 <sup>th</sup> Mile	54:46	54:46

(Source: Compiled by Consultant)

### 5.11.3.1.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-58. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 32% and 38% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 7% of traffic.

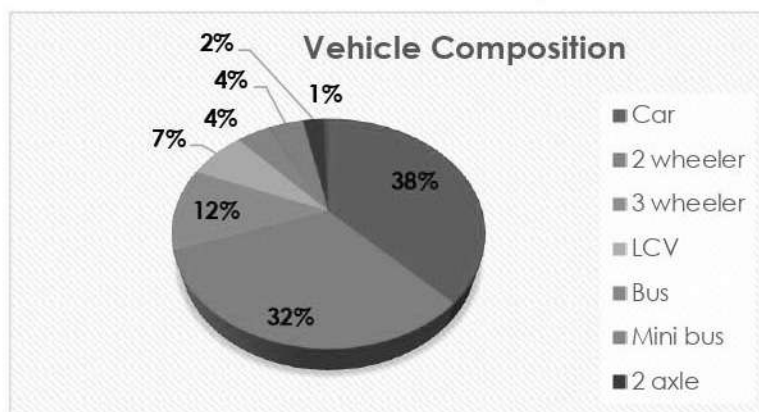


Figure 5-58 Composition of Traffic on 9<sup>th</sup> mile

(Source: Compiled by Consultant)

### 5.11.3.1.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at 9<sup>th</sup> Mile as shown in Figure 5-59.

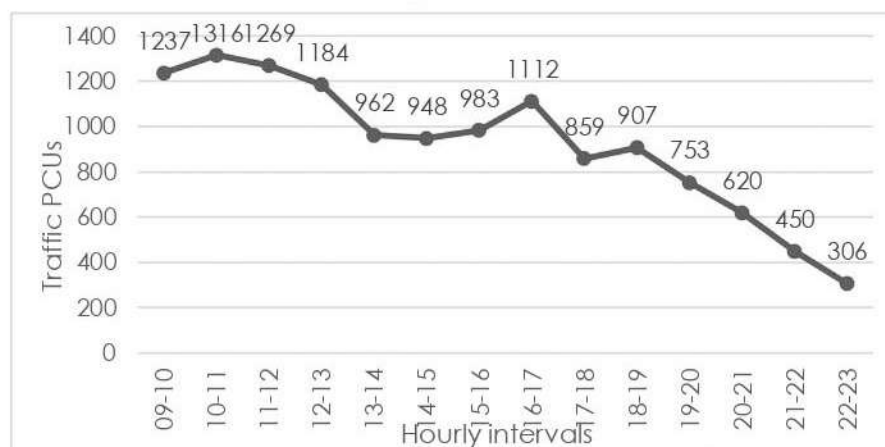


Figure 5-59 Hourly Variation of traffic at 9<sup>th</sup> mile

(Source: Compiled by Consultant)

### 5.11.3.1.4 Peak Hour Traffic

Peak hour was found to be from 10:00 to 11:00 HRS. Total peak hour traffic is 1316 in PCU which is 10% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-77.

Table 5-77 Peak hour traffic on 9<sup>th</sup> Mile Road

PCU/hr	Peak Hours	Peak Hour Factor
1316	10:00 to 11:00	10%

### 5.11.3.2 Guwahati to Goalpara

Annual average daily traffic is **11881** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like 2 Axle, MAV were less in volume.. ADT and AADT by vehicle type is presented in Table 5-78.

Table 5-78 Average Daily Traffic & Annual Average Daily Traffic on Guwahati to Goalpara Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	3185	3728
2-wheeler	2830	3062
3-wheeler	281	352
Minibus	0	0
Standard Bus	482	573
3-wheeler (Goods)	0	0
LCV	1016	1173
2 Axle	658	794
3 Axle	0	0
MAV	105	185
Tractor	0	0
Tractor with Tractor	0	0
Cycle rikshaw	0	0
Cycle	73	89
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>8630</b>	<b>9956</b>
<b>Total (PCU)</b>	<b>10032</b>	<b>11881</b>

(Source: Compiled by Consultant)

#### 5.11.3.2.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-79.

Table 5-79 Directional Distribution of Traffic on GHY to Goalpara Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Guwahati to Goalpara: Goalpara to Guwahati	Guwahati to Goalpara: Goalpara to Guwahati
GHY to Goalpara road	60:40	60:40

(Source: Compiled by Consultant)

### 5.11.3.2.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-60. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 35% and 34% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 17% of traffic.

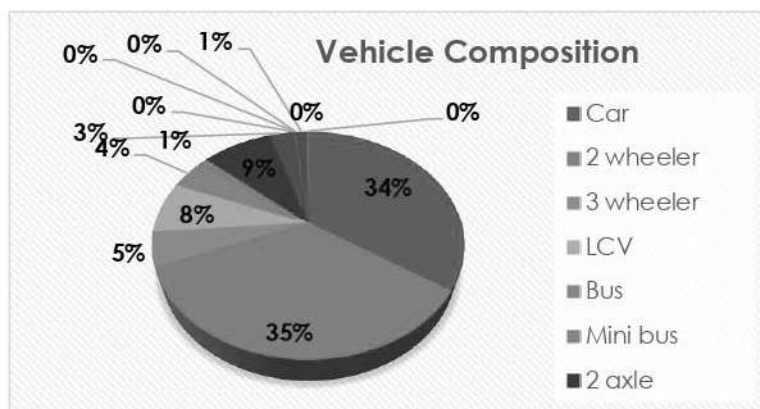


Figure 5-60 Composition of Traffic on GHY to Goalpara

(Source: Compiled by Consultant)

### 5.11.3.2.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Ghy to Goalpara as shown in Figure 5-61.

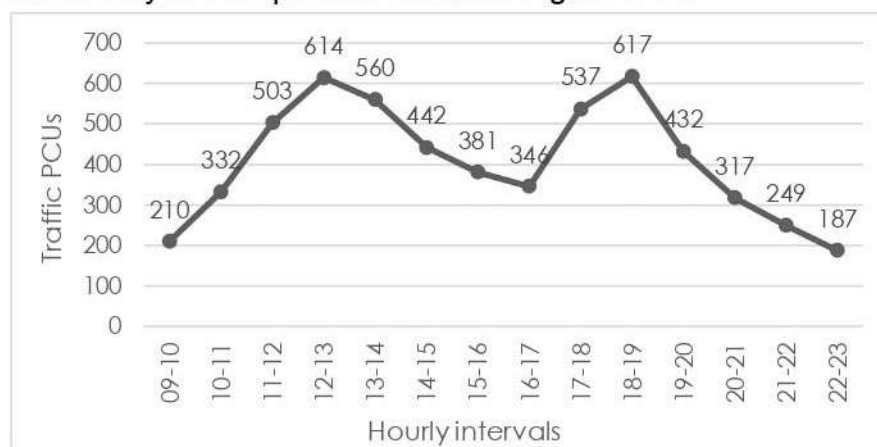


Figure 5-61 Hourly Variation of traffic at GHY to Goalpara

(Source: Compiled by Consultant)

### 5.11.3.2.4 Peak Hour Traffic

Peak hour was found to be from 18:00 to 19:00 HRS. Total peak hour traffic is 617 in PCU which is 10.7% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-80.

Table 5-80 Peak hour traffic on GHY to Goalpara Road

PCU/hr	Peak Hours	Peak Hour Factor
617	18:00 to 19:00	10.7%



### 5.11.3.3 Bahaita to Silla

Annual average daily traffic is **23490** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were also present with good amount ADT and AADT by vehicle type is presented in Table 5-81.

Table 5-81 Average Daily Traffic & Annual Average Daily Traffic on Bahaita to Silla Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	6904	7095
2-wheeler	5615	5932
3-wheeler	1733	1942
Minibus	0	0
Standard Bus	950	1024
3-wheeler (Goods)	0	0
LCV	1824	1984
2 Axle	1314	1472
3 Axle	93	118
MAV	217	252
Tractor	11	34
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	39	63
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>18700</b>	<b>19916</b>
<b>Total (PCU)</b>	<b>2183</b>	<b>23490</b>

(Source: Compiled by Consultant)

#### 5.11.3.3.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-82.

Table 5-82 Directional Distribution of Traffic on Bahaita to Silla Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Bahaita to Silla: Silla to Bahaita	Bahaita to Silla: Silla to Bahaita
Bahaita to Silla	57:43	57:43

(Source: Compiled by Consultant)

### 5.11.3.3.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-62. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 27% and 30% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 17% of traffic.

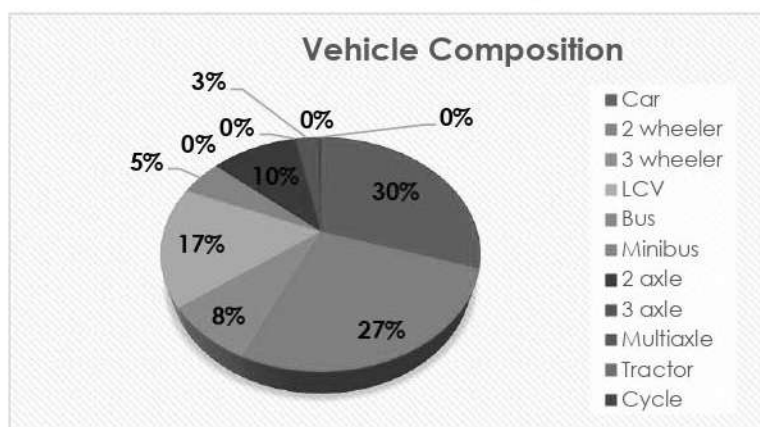


Figure 5-62 Composition of Traffic on Bahaita to Silla

(Source: Compiled by Consultant)

### 5.11.3.3.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Bahaita to Silla as shown in Figure 5-63.

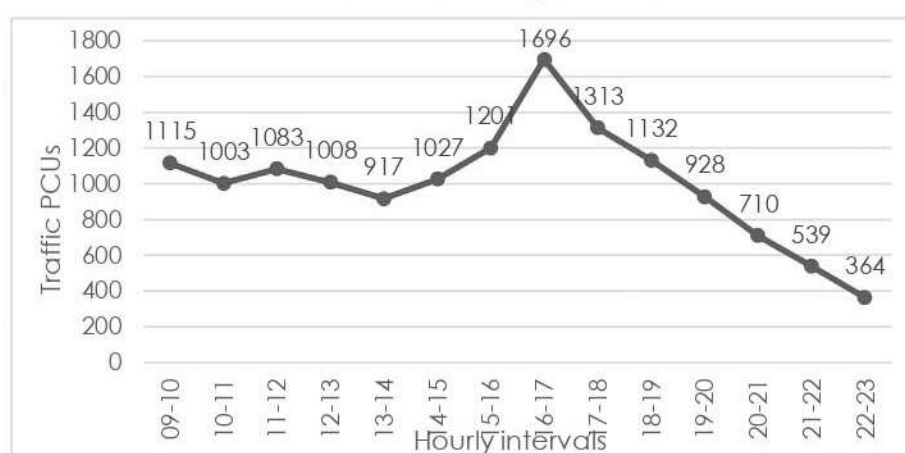


Figure 5-63 Hourly Variation of traffic at Bahaita to Silla

(Source: Compiled by Consultant)

### 5.11.3.3.4 Peak Hour Traffic

Peak hour was found to be from 16:00 to 17:00 HRS. Total peak hour traffic is 1696 in PCU which is 12% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-83.

Table 5-83 Peak hour traffic on Bahaita to Silla

PCU/hr	Peak Hours	Peak Hour Factor
1696	16:00 to 17:00	12%

#### 5.11.3.4 **Dadara Hajo to Guwahati**

Annual average daily traffic is **13170** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good numbers while heavy goods vehicles like 2 Axle and MAV were observed. ADT and AADT by vehicle type is presented in Table 5-84.

*Table 5-84 Average Daily Traffic & Annual Average Daily Traffic on Dadara Hajo to GHY*

Vehicle Types	ADT	AADT
Car/Jeep/Van	4742	4873
2-wheeler	3741	3982
3-wheeler	2254	2418
Minibus	0	0
Standard Bus	307	426
3-wheeler (Goods)	0	0
LCV	689	732
2 Axle	102	118
3 Axle	0	0
MAV	9	13
Tractor	4	16
Tractor with Tractor	10	23
Cycle rikshaw	0	0
Cycle	29	42
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>11887</b>	<b>12643</b>
<b>Total (PCU)</b>	<b>12213</b>	<b>13170</b>

(Source: Compiled by Consultant)

#### 5.11.3.4.1 **Directional Split**

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-85.

*Table 5-85 Directional Distribution of Traffic on Dadara Hajo to GHY Road*

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Dadara Hajo to GHY: GHY to Dadara Hajo	Dadara Hajo to GHY: GHY to Dadara Hajo
Dadara Hajo to GHY	58:42	58:42

(Source: Compiled by Consultant)

#### 5.11.3.4.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-64. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 31% and 40% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 6% of traffic.

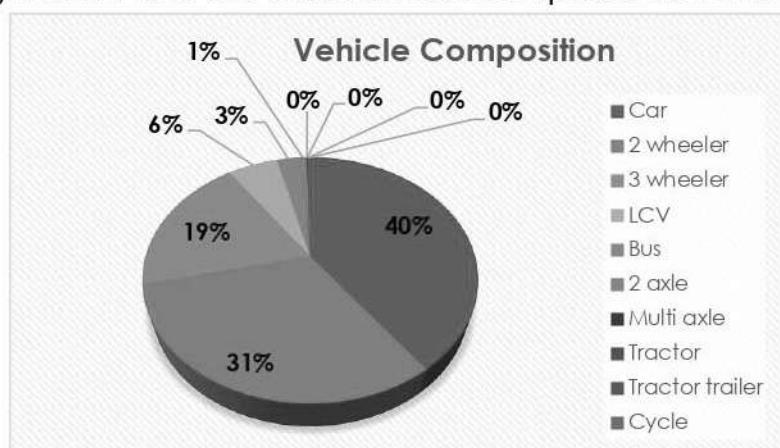


Figure 5-64 Composition of Traffic on Dadara Hajo to GHY

(Source: Compiled by Consultant)

#### 5.11.3.4.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Dadara Hajo to GHY as shown in Figure 5-65.

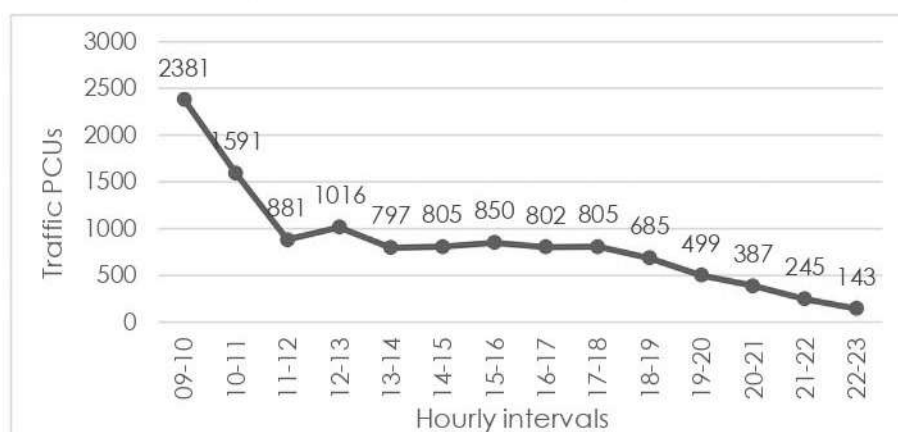


Figure 5-65 Hourly Variation of traffic at Dadar Hajo to GHY

(Source: Compiled by Consultant)

#### 5.11.3.4.4 Peak Hour Traffic

Peak hour was found to be from 09:00 to 10:00 HRS. Total peak hour traffic is 2381 in PCU which is 20% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-86.

Table 5-86 Peak hour traffic on Dadara Hajo to GHY Road

PCU/hr	Peak Hours	Peak Hour Factor
2381	09:00 to 10:00	20%

### 5.11.3.5 Guwahati to Mandkata

Annual average daily traffic is **7652** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good numbers while heavy goods vehicles like 2 Axle and some MAV were observed. ADT and AADT by vehicle type is presented in Table 5-87.

Table 5-87 Average Daily Traffic & Annual Average Daily Traffic on GHY to Mandkata Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	2125	2273
2-wheeler	3266	3462
3-wheeler	352	436
Minibus	0	0
Standard Bus	0	0
3-wheeler (Goods)	0	0
LCV	924	1076
2 Axle	103	234
3 Axle	0	0
MAV	5	11
Tractor	0	0
Tractor with Trailor	10	23
Cycle rikshaw	0	0
Cycle	172	204
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>6957</b>	<b>7719</b>
<b>Total (PCU)</b>	<b>6663</b>	<b>7652</b>

(Source: Compiled by Consultant)

#### 5.11.3.5.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-88.

Table 5-88 Directional Distribution of Traffic on GHY to Mandkata Road

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Guwahati City to Mandkata: Mandkata to Guwahati City	Guwahati City to Mandkata: Mandkata to Guwahati City
GHY to Mandkata	56:44	56:44

(Source: Compiled by Consultant)

### 5.11.3.5.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-66. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 47% and 31% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 13% of traffic.

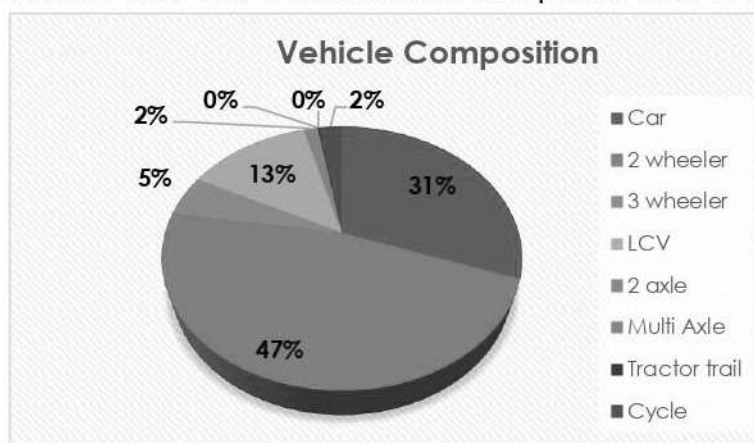


Figure 5-66 Composition of Traffic on GHY to Mandkata

(Source: Compiled by Consultant)

### 5.11.3.5.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at GHY to Mandkata as shown in Figure 5-67.

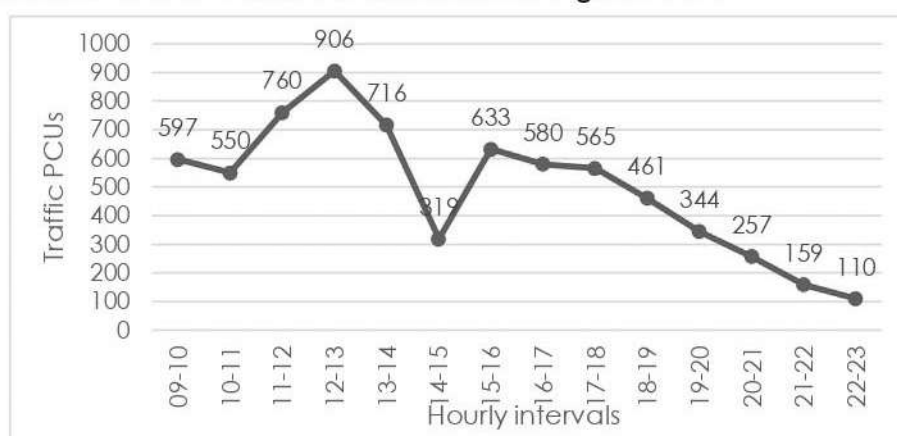


Figure 5-67 Hourly Variation of traffic at GHY to Mandkata

(Source: Compiled by Consultant)

### 5.11.3.5.4 Peak Hour Traffic

Peak hour was found to be from 12:00 to 13:00 HRS. Total peak hour traffic is 906 in PCU which is 13% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-89.

Table 5-89 Peak hour traffic on GHY to Mandkata Road

PCU/hr	Peak Hours	Peak Hour Factor
906	12:00 to 13:00	13%

### 5.11.3.6 Guwahati to Majirgaon

Annual average daily traffic is **3498** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in small number while heavy goods vehicles like 2 Axle, were observed. ADT and AADT by vehicle type is presented in Table 5-90.

Table 5-90 Average Daily Traffic & Annual Average Daily Traffic on GHY City to Majirgaon

Vehicle Types	ADT	AADT
Car/Jeep/Van	708	843
2-wheeler	1839	1964
3-wheeler	549	673
Minibus	0	0
Standard Bus	41	83
3-wheeler (Goods)	0	0
LCV	312	0
2 Axle	25	43
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	174	195
Other (hand cart)	0	0
Total (Nos)	<b>3648</b>	<b>3801</b>
Total (PCU)	<b>3415</b>	<b>3498</b>

(Source: Compiled by Consultant)

#### 5.11.3.6.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-91.

Table 5-91 Directional Distribution of Traffic on GHY city to Majirgaon

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Guwhati City to Majirgaon: Majirgaon to Guwhati City	Guwhati City to Majirgaon: Majirgaon to Guwhati City
GHY to Majirgaon	50:50	50:50

(Source: Compiled by Consultant)

### 5.11.3.6.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-68. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 50% and 19% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axle vehicles comprised 9% of traffic.

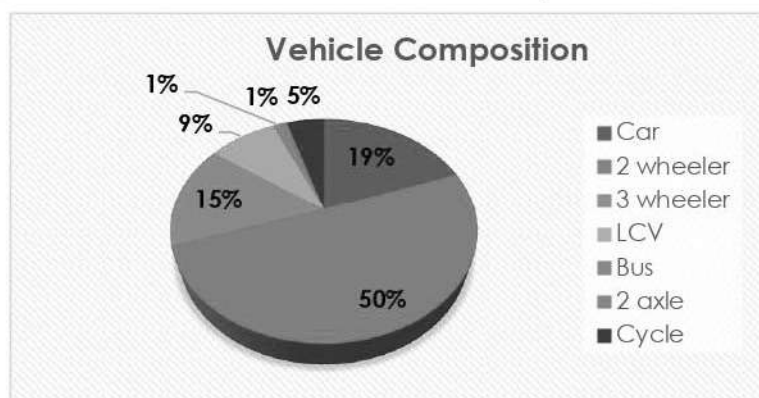


Figure 5-68 Composition of Traffic on GHY to Majirgaon

(Source: Compiled by Consultant)

### 5.11.3.6.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at GHY city to Majirogaon as shown in Figure 5-69.

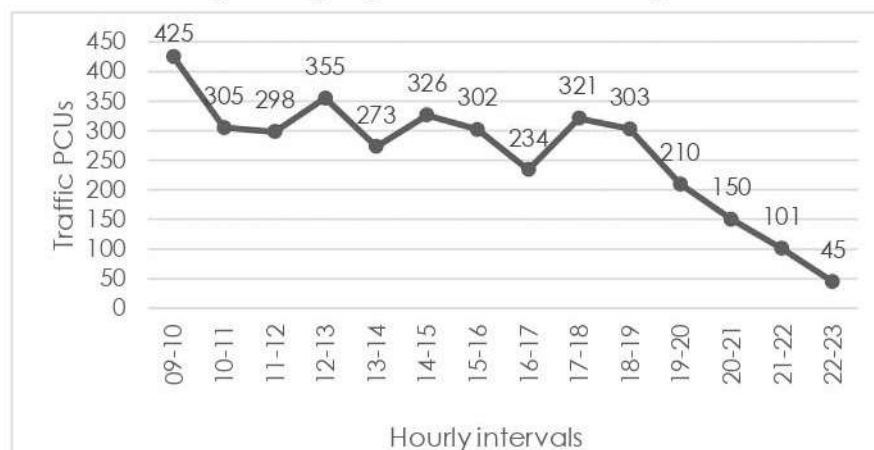


Figure 5-69 Hourly Variation of traffic at GHY to Majirgaon

(Source: Compiled by Consultant)

### 5.11.3.6.4 Peak Hour Traffic

Peak hour was found to be from 09:00 to 10:00 HRS. Total peak hour traffic is 425 in PCU which is 11% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-92.

Table 5-92 Peak hour traffic on GHY to Majirgaon Road

PCU/hr	Peak Hours	Peak Hour Factor
425	09:00 to 10:00	11%



### 5.11.3.7 Panikhaiti to Narengi

Annual average daily traffic is **4465** PCU in this road section. Passenger vehicles like four-wheeler vehicles and two wheelers predominate the traffic stream. Non-Motorized vehicles were observed in medium volume. LCV vehicles were present in good number while heavy goods vehicles like Axle, MAV were not observed. ADT and AADT by vehicle type is presented in Table 5-93.

Table 5-93 Average Daily Traffic & Annual Average Daily Traffic on Panikhatai to Narengi Road

Vehicle Types	ADT	AADT
Car/Jeep/Van	1590	1683
2-wheeler	1720	1852
3-wheeler	390	462
Minibus	0	0
Standard Bus	0	0
3-wheeler (Goods)	0	0
LCV	464	569
2 Axle	0	0
3 Axle	0	0
MAV	0	0
Tractor	0	0
Tractor with Trailor	0	0
Cycle rikshaw	0	0
Cycle	65	84
Other (hand cart)	0	0
<b>Total (Nos)</b>	<b>4229</b>	<b>4650</b>
<b>Total (PCU)</b>	<b>4030</b>	<b>4465</b>

(Source: Compiled by Consultant)

#### 5.11.3.7.1 Directional Split

The traffic data was analyzed to establish the directional distribution of traffic. The directional distribution of traffic at the TVC location is given in Table 5-94.

Table 5-94 Directional Distribution of Traffic on Panikhaiti to Narengi

TVC Location	Directional distribution in vehicle numbers	Directional distribution in PCU
	Panikhaiti to Narengi: Narengi to Panikhaiti	Panikhaiti to Narengi: Narengi to Panikhaiti
Panikhaiti to Narengi	56:44	56:44

(Source: Compiled by Consultant)

### 5.11.3.7.2 Vehicle Composition

Composition of traffic at the midblock location is presented in Figure 5-70. Road section is occupied by mainly two-wheeler and four-wheeler vehicles which are 41% and 38% of total traffic. Thus, commuters are using their personal vehicles to a large extent for daily routine. LCV and 2 axel vehicles comprised 11% of traffic.

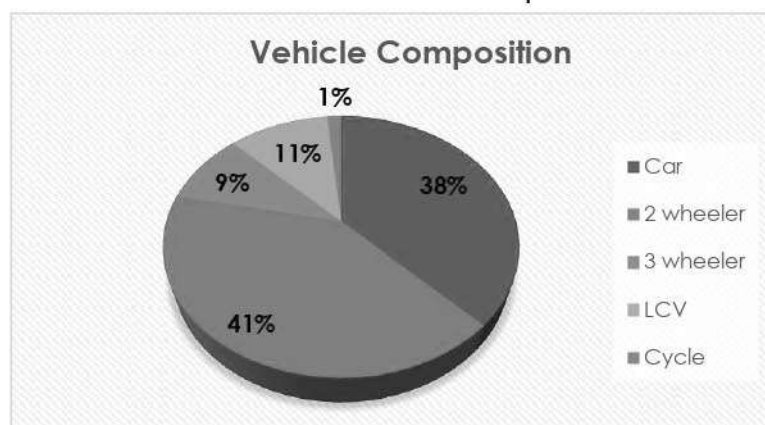


Figure 5-70 Composition of Traffic on Panikhaiti to Narengi

(Source: Compiled by Consultant)

### 5.11.3.7.3 Hourly Variation of Traffic

The hourly distribution of traffic to understand hourly variation and peak hour traffic characteristics at Panikhetai to Narengi as shown in Figure 5-71.



Figure 5-71 Hourly Variation of traffic at Panikhaiti to Narengi

(Source: Compiled by Consultant)

### 5.11.3.7.4 Peak Hour Traffic

Peak hour was found to be from 14:00 to 15:00 HRS. Total peak hour traffic is 479 in PCU which is 11% of ADT. The peak hour and peak hour traffic at the midblock location is presented in Table 5-95.

Table 5-95 Peak hour traffic on Panikhaiti to Narengi

PCU/hr	Peak Hours	Peak Hour Factor
479	14:00 to 15:00	11%

### 5.11.4 Traffic Congestion

Traffic congestion takes place when traffic spills over than the design capacity of any road. The severity of traffic congestion can be identified using average daily traffic count und volume by capacity ratio method. Ratio greater than 1 indicates sever congestion, 0.75 to 1 indicates heavy congestion, 0.50 to 0.75 indicates moderate congestion and less than 0.5 considered as low congestion.

Table 5-96 V/C ratio on Major roads

Sr no	Location of internal roads	ADT	V/C
1	NH-37 (Jalukbari to Khanapara)	11284	0.32
2	Gorchuk to Fatasil Ambari	6401	0.36
3	Jalukbari to Bharalumukh	74341	2.1
4	Lokhra to Lal Ganesh	6574	0.37
5	Basistha Chairali to Ganeshguri	21280	0.6
6	Lal Ganesh to Ganeshguri	10278	0.58
7	Ulubari to Khanapara	41660	1.95
8	Ganeshguri to Chandmari	15910	0.45
9	Narengi to Chandmari	21095	1.2
10	MG road	74341	2.13
11	GHY Club to Ulubari	20175	0.57
12	Bhagagarh to Fatasil Ambari	14149	0.40
13	Paltan Bazar	14590	0.83
14	Mahapurush Madhabdev Path	11019	0.31
15	GMCH road	22378	1.2

(Source: Compiled by Consultant)

Sr no	Location of external roads	ADT	V/C
1	9 <sup>th</sup> Mile	12906	0.36
2	Guwhati to Goalpara	8630	0.49
3	Bahaita to Silla	18700	1.07
4	Dadara Hajo to GHY	11887	0.68
5	GHY to Mandkata	6957	0.39
6	Ghy City to Majirgaon	3648	0.2
7	Panikhatai to Narengi	4229	0.24

Form the analysis mentioned in above Table 5-96 it can be inferred that the patches of NH-37 (Jalukbari to Khanapara), Ulubari to Khanapara, Narengi to Chandmari, MG road and Baihata to Silla Road are congested with severe traffic. Another major roads like GHY Club to Ulubari road, Dadara Hajo to Guwahati city are moderately congested in peak hours.

**5.11.4.1 Overview of Critical Roads**

Road capacity, in general refers to the maximum traffic flow obtainable on a given roadway using all available lanes. Critical roads depend upon several factors, mainly, traffic conditions, road geometry characteristics, environmental factors etc. The critical assessment of road capacities on major urban roads is carried out by field traffic surveys to capture the classified volume count for major roads spread across the city through manual as well as video graphic techniques. Based on the collected data, the existing traffic volume per lane was ascertained during peak hours. This has been compared with the maximum road capacity values to critically analyse the existing capacity potential of major roads in the city. Based on our study, the critical roads were observed and depicted in figure given below. The critical roads, depicted with red colour, include, GMCH road, Jalukbari to Bharalumukh, Narengi to Chandmari, NH-37 (Jalukbari to Khanapara) and MG Road indicates that there is need to decongest the roads either by road widening, proposing grade separators or by linking the roads in order to ensure free flow of traffic movement in GMPA.



## 5.12 Trips and Mode Preferences

### 5.12.1 Trip share of passenger Vehicle

The analysis of passenger vehicles shows that maximum traffic (45%) circulates within Guwahati City. Traffic between Guwahati and another district observed 20% where major traffic flow plays between Kamalpur and Sonapur as 15%.and 9% respectively.

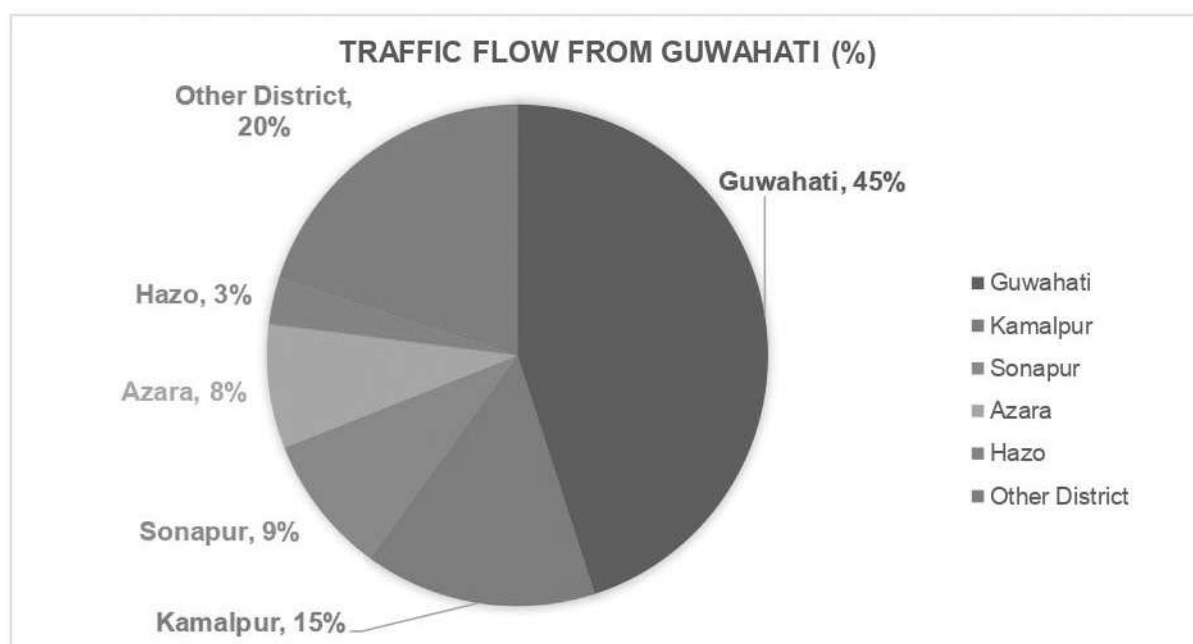


Figure 5-73: Major Trip Distribution of Vehicles

(Source: Consultant Compilation)

### 5.12.2 Occupancy and Trip Purpose

The analysis of OD data for passenger cars and Auto rickshaws shows that the average occupancy for these vehicles along the project road is 2 and 3. It is observed that the major share of trips is related to work. The distribution of car passengers by trip purpose is shown in Table 5-74.

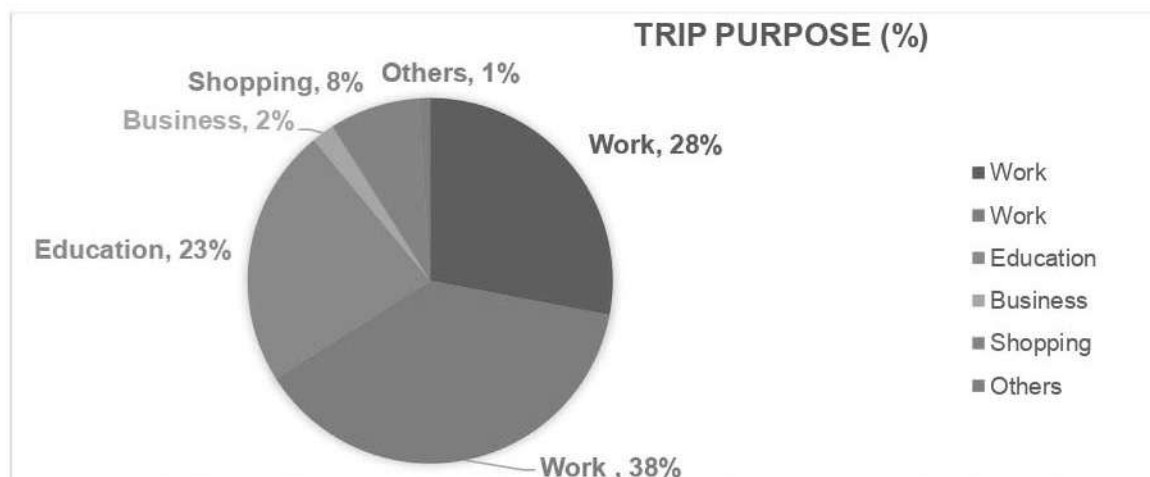


Figure 5-74 Distribution of Car Passengers by Trip Purpose

(Source: Consultant Compilation)

### 5.12.3 Modal Share

In Guwahati the number of trips by walk account for 21% of the total trips made daily. Public transport has a share of 8% of the total trips. Cars and two wheelers have a share of 18% and 20% respectively. The mode wise share of Guwahati has been presented in Figure 5-75.

Bi-Cycle and the Walking are the major preferable mode of transport. However, the necessary infrastructure is lacking. Further Public Transport constitute of only 8% of the share. The same needs to be improved and increased.

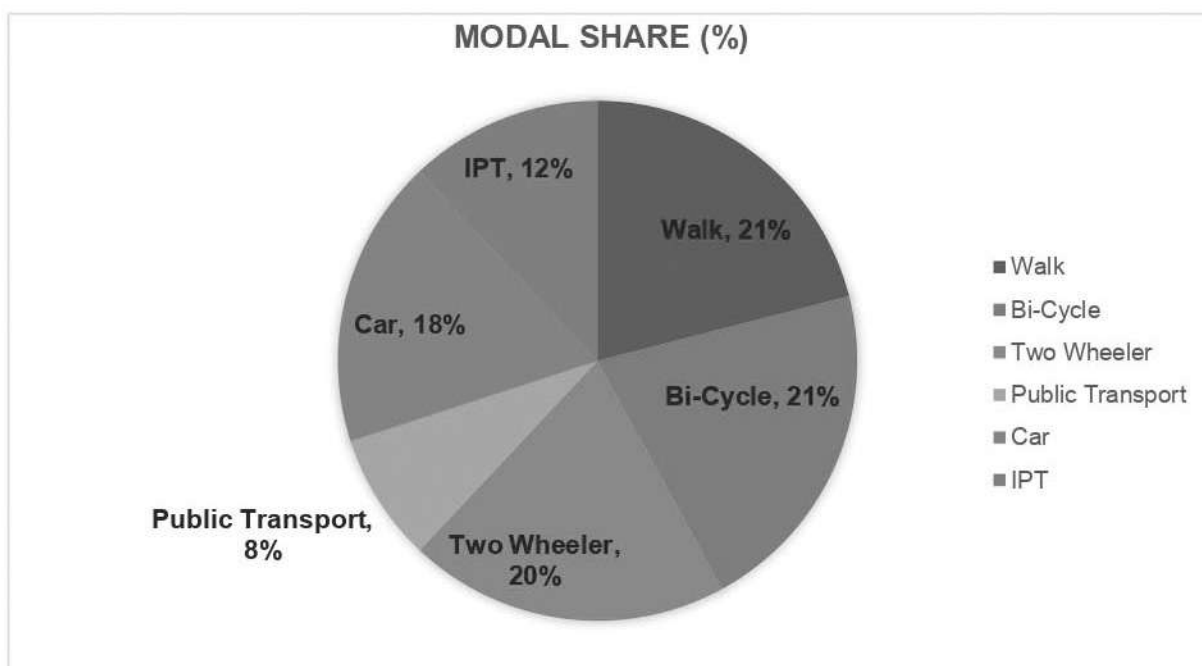


Figure 5-75 Model Share of transport in Guwahati city

## 5.13 Junction Analysis

The areas with major traffic congestion have been marked Figure 5-77 with red spots. These are the areas where most of the problems generate due to various reasons and lead to congestion. These areas include Ghy club circle, Gorchuk junction, Khanapara, Ganeshguri, Lokhra junctions, Basistha Chairali, Maligaon and many other junctions in and around the Guwahati city.

### 5.13.1 Intersections and its types

All the differentiated categories of junctions have been mentioned in the tabled below. Table 5-97 represents the roundabouts and rotaries, Table 5-98 represents all the cross junctions, Table 5-99 shows the Y-junctions and Table 5-100 shows the T-junctions in Guwahati Master plan area.

Table 5-97 List of Rotaries in Guwahati MP area

Sl. No.	Roundabouts/Rotary
1.	Guwahati Club
2.	Narengi junction
3.	Maligaon junction

(Source: Compiled by Consultants)

Table 5-98 List of cross junctions in Guwahati MP area

Sl. No.	Cross Junctions
1.	Fatasil Ambari
2.	Gorchuk junction
3.	Lokhra junction
4.	Basistha Chairali
5.	Sarabhati junction
6.	Jalukbari junction
7.	Beharbari junction
8.	Ganeshguri junction
9.	Bharalumukh junction
10.	Kachari junction
11.	Khanapara junction
12.	Bahaita junction
13.	Mandkata to Guwahati City
14.	Narengi to Panikhaiti

(Source: Compiled by Consultants)

Table 5-99 List of Y - Junctions in Guwahati MP area

Sl. No.	Y - Junction
1.	Ulubari junction
2.	Six miles junction
3.	Goalpara Junction
4.	9 <sup>th</sup> mile junction
5.	Majirgaon junction

(Source: Compiled by Consultants)



Table 5-100 List of T - Junctions in Guwahati MP area

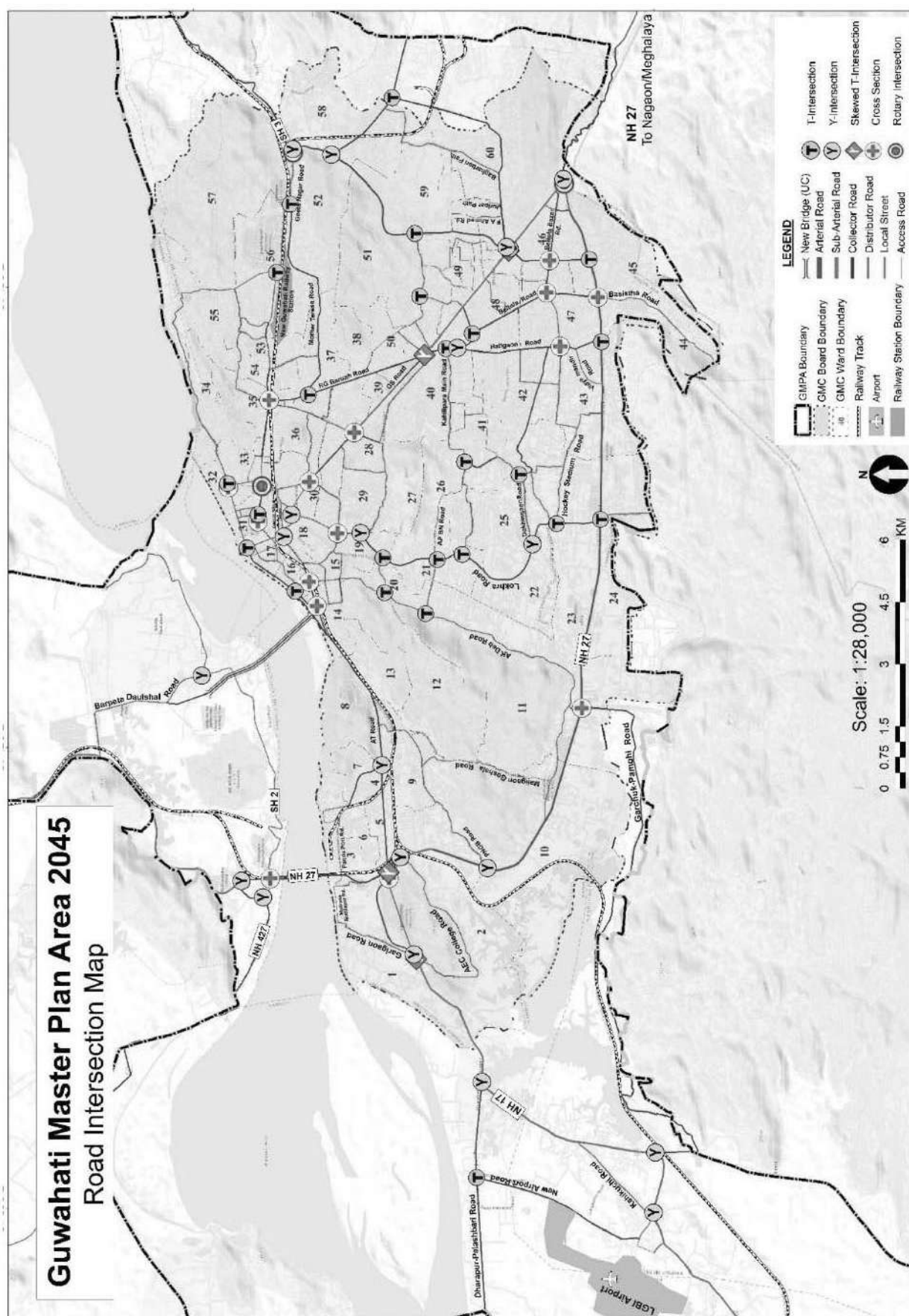
Sl. No.	T - Junction
1.	Bhangagarh junction
2.	Chandmari junction
3.	Lal ganesh junction
4.	Dadara Hajo

(Source: Compiled by Consultants)

The map below shows the analysis of junctions whether the junction is cross junction, T-junction, Y-junction, or Rotary (refer Figure 5-76).

These junctions are further divided into inner and outer cordons according to locations, as 7 cordons are far from main city and only serve the outer region of Guwahati. The rest 19 mid blocks fall in the main city area, connecting to the major roads of the Guwahati City.

Major intersection nodes of GMPA are described in Figure 5-76 and the points selected for intersection (Junction) analysis are marked in Figure 5-77. The highlighted yellow points in the figure 5-27 are major 19 mid-block points and red are the outer cordon points selected across the city for junction analysis.





### 5.13.2 Inner Cordons

#### 5.13.2.1 Intersection – 1 (Guwahati Club)

Table 5-101 Intersection 1 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestio. Hours
GHY Club to Jalukbari)	14	4 lanes divided Two-way	4	17:00 hrs. & 18:0 hrs.
GHY Club to Silpkhuri				
GHY Club to Ulubari				
GHY Club to Uzanbazar				

(Source: Compiled by Consultants)



Figure 5-78 Queuing Length of Intersection 1

This Junction is a 4-Arm junction and the total daily traffic at GHY club and Ulubari at GHY club point is 18560 PCU. The peak hour and peak hour traffic at the junction are presented in Table 5-102.

Table 5-102 Peak hour traffic at GHY club point

Peak Hour	17:00-18:00
Peak Hour Traffic (PCU/hr)	2003

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment.

Table 5-103 Veh/Day at GHY Club Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
GHY Club junction	6755	20175

(Source: Compiled by Consultants)

### 5.13.2.2 Intersection - 2 (Narengi junction)

Table 5-104 Intersection 2 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Narengi to Patharquary	14	4 lanes divided	3	16:00 hrs.
Patharquary to Narengi		Two-way		& 17:00 hrs.

(Source: Compiled by Consultants)



Figure 5-79 Queuing Length of Intersection 2

Narengi point is a 3-Arm junction and the total daily traffic at this Junction is 11425 PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-105

Table 5-105 Peak hour traffic at Narengi road Junction

<b>Peak Hour</b>	<b>16:00-17:00</b>
<b>Peak Hour Traffic (PCU/hr)</b>	<b>1020</b>

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment, electricity poles and vendors along with geometric improvement, channelization, and signalisation.

Table 5-106 Veh/Day at Park road Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Narengi Junction	9858	11019

(Source: Compiled by Consultants)



**5.13.2.3 Intersection - 3 (Fatasil Ambri junction)**

Table 5-107 Intersection 3 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Fatasil Ambari to Athgaon	7	2 lanes undivided Two-way	2	17:00 hrs. to 18:00 hrs.
Fatasil Ambri to Gorchuk				

(Source: Compiled by Consultants)

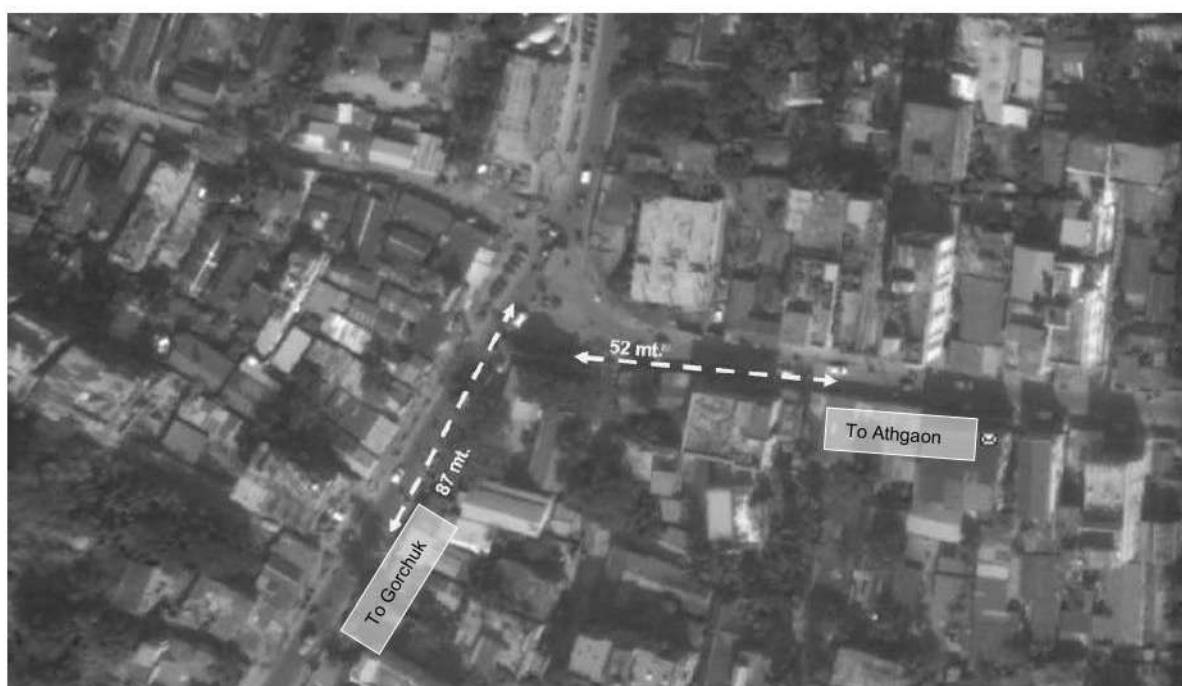


Figure 5-80 Queuing Length of Intersection 3

Fatasil Ambari Junction is a 3-Arm junction and the total daily traffic at junction is 6162 PCU. The peak hour and peak hour traffic at the junction are presented in Table 5-108.

Table 5-108 Peak hour traffic at Fatasil Ambri Junction

Peak Hour	17:00-18:00
Peak Hour Traffic (PCU/hr)	663

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization and signalisation.

Table 5-109 Veh/Day at Fatasil Ambari Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Fatasil Ambri Junction	3868	6456

(Source: Compiled by Consultants)

### 5.13.2.4 Intersection - 4 (Gorchuk junction)

Table 5-110 Intersection 4 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Gorchuk to Dipobeel	7	2 lanes undivided	2	9:00 hrs.to10:00 hrs.
Gorchuk to fatasil Ambri		Two-way		

(Source: Compiled by Consultants)



Figure 5-81 Queuing Length of Intersection 4

Gorchuk Junction is a 4-Arm junction and the total daily traffic at junction is **6205** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-111.

Table 5-111 Peak hour traffic at Gorchuk Junction

Peak Hour	09:00-10:00
Peak Hour Traffic (PCU/hr)	730

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment, electricity poles and vendors along with geometric improvement, channelization and signalisation.

Table 5-112 Veh/Day at Gorchuk Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Gorchuk Junction	3938	6401

(Source: Compiled by Consultants)

**5.13.2.5 Intersection - 5 (Sarabhati Junction)**

Table 5-113 Intersection 5 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Sarabhati to Athgaon	14	2 lanes undivided	3	10:00 to 11:00 hrs
Sarabhati to Kalpahar		Two-way		
Sarabhati to Nepali Mandir				
Ullubari to Sarabhati				

(Source: Compiled by Consultants)



Figure 5-82 Queuing Length of Intersection 5

Sarabhati Junction is a 4-Arm junction and the total daily traffic at this junction is **22063** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-114.

Table 5-114 Peak hour traffic at Sarabhati Junction

Peak Hour	10:00-11:00
Peak Hour Traffic (PCU/hr)	2479

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment, electricity poles and vendors along with geometric improvement, channelization, and signalisation.

Table 5-115 Veh/Day at Sarabhati Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Sarabhati Junction	14159	22378

(Source: Compiled by Consultants)



### 5.13.2.6 Intersection - 6 (Beharbari Junction)

Table 5-116 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Beharbari to GHY city	14	4 lanes undivided	3	09:00 hrs. to 10:00 hrs.
Ghy city to Beharbadi		Two-way		

(Source: Compiled by Consultants)



Figure 5-83 Queuing Length of Intersection 6

Beharbadi Junction is a 4-Arm junction and the total daily traffic at the Junction is **4648** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-117.

Table 5-117 Peak hour traffic at Beharbari Junction

Peak Hour	09:00 to 10:00
Peak Hour Traffic (PCU/hr)	494

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-118 Veh/Day at Beharbari Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Beharbari junction	4311	4874

(Source: Compiled by Consultants)

**5.13.2.7 Intersection - 7 (Bhangagarh Junction)**

Table 5-119 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Bhangagarh to GMC	14	4 lanes undivided Two-way	3	18:00 hrs. to 19:00 hrs.
Bhangagarh to Rajgarh	7	2 lane undivided Two-way	2	

(Source: Compiled by Consultants)



Figure 5-84 Queuing Length of Intersection 7

Bhangagarh Junction is a 3-Arm junction and the total daily traffic at the Junction is **6885** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-120.

Table 5-120 Peak hour traffic at Bhangagarh Junction

Peak Hour	18:00 to 19:00
Peak Hour Traffic (PCU/hr)	737

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-121 Veh/Day at Bhangagarh Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Bhangagarh junction	6834	7360

(Source: Compiled by Consultants)

### 5.13.2.8 Intersection - 8 (Chandmari Junction)

Table 5-122 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Chandmari to Bamunidam	14	4 lanes undivided	3	17:00 hrs. to 18:00 hrs.
Chandmari to Krishnanagar		Two-way		
Zoo road to Ganeshguri				
Zoo road to Narengi				

(Source: Compiled by Consultants)



Figure 5-85 Queuing Length of Intersection 8

Chandmari Junction is a 3-Arm junction and the total daily traffic at the Junction is **20891** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-123.

Table 5-123 Peak hour traffic at Chandmari Junction

Peak Hour	17:00 to 18:00
Peak Hour Traffic (PCU/hr)	1989

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-124 Veh/Day at Chandmari Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Beharbari junction	11634	21095

(Source: Compiled by Consultants)

**5.13.2.9 Intersection - 9 (Ganeshguri Junction)***Table 5-125 Intersection 6 Traffic Congestion Details*

<b>Road</b>	<b>C. W. Width (m)</b>	<b>No. of Lanes</b>	<b>Shoulder + Footpath Width (m)</b>	<b>Peak Congestion Hours</b>
<i>Ganeshguri to Hatigaon</i>	14	4 lanes undivided Two-way	3	11:00 hrs. to 12:00 hrs.
<i>Ganeshguri to Khanapara</i>				
<i>Ganeshguri to Zoo Road</i>				

*(Source: Compiled by Consultants)**Figure 5-86 Queuing Length of Intersection 9*

Ganeshguri Junction is a 4-Arm junction and the total daily traffic at the Junction is **22822** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-126

*Table 5-126 Peak hour traffic at Ganeshguri Junction*

<b>Peak Hour</b>	<b>11:00 to 12:00</b>
Peak Hour Traffic (PCU/hr)	3195

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-127 Veh/Day at Ganeshguri Junction*

<b>Location</b>	<b>Minor Road (Veh/day)</b>	<b>Major Road (Veh/Day)</b>
Ganeshguri junction	15910	24066

*(Source: Compiled by Consultants)*

**5.13.2.10 Intersection - 10 (Maligaon Junction)***Table 5-128 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Jalukbari to Pandu	7	2 lanes undivided Two-way	2	14:00 hrs. to 15:00 hrs.
Pandu to Bharalumukh				

*(Source: Compiled by Consultants)**Figure 5-87 Queuing Length of Intersection 10*

Maligaon Junction is a 6-Arm junction and the total daily traffic at the Junction is **5305** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-129.

*Table 5-129 Peak hour traffic at Maligaon Junction*

Peak Hour	14:00 to 15:00
Peak Hour Traffic (PCU/hr)	581

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-130 Veh/Day at Maligaon Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Maligaon junction	3247	5352

*(Source: Compiled by Consultants)*



**5.13.2.11 Intersection - 11 (Jalukbari Junction)**

Table 5-131 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Jalukbari to Maligaon	14	4 lane undivided Two-way	3	10:00 hrs. to 11:00 hrs.
Maligaon to Jalukbari			3	

(Source: Compiled by Consultants)



Figure 5-88 Queuing Length of Intersection 11

Jalukbari Junction is a 4-Arm junction and the total daily traffic at the Junction is **23797** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-132.

Table 5-132 Peak hour traffic at Jalukbari Junction

<b>Peak Hour</b>	<b>10:00 to 11:00</b>
Peak Hour Traffic (PCU/hr)	3158

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-133 Veh/Day at Jalukbari Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Jalukbari junction	25240	25592

(Source: Compiled by Consultants)

**5.13.2.12 Intersection - 12 (Lal Ganesh Junction)***Table 5-134 Intersection 6 Traffic Congestion Details*

<b>Road</b>	<b>C. W. Width (m)</b>	<b>No. of Lanes</b>	<b>Shoulder + Footpath Width (m)</b>	<b>Peak Congestion Hours</b>
Kahilipara to Lal ganesh	7	2 lane undivided Two-way	3	09:00 hrs. to 10:00 hrs.
Lal ganesh to Kahilipara				

*(Source: Compiled by Consultants)**Figure 5-89 Queuing Length of Intersection 12*

Lal Ganesh Junction is a 3-Arm junction and the total daily traffic at the Junction is 9394 PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-135.

*Table 5-135 Peak hour traffic at Lal Ganesh Junction*

<b>Peak Hour</b>	<b>09:00 to 10:00</b>
Peak Hour Traffic (PCU/hr)	910

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-136 Veh/Day at Lal ganesh Junction*

<b>Location</b>	<b>Minor Road (Veh/day)</b>	<b>Major Road (Veh/Day)</b>
Lal Ganesh junction	8029	10278

*(Source: Compiled by Consultants)*

**5.13.2.13 Intersection - 13 (Bharalumukh Junction)**

Table 5-137 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Bharalumukh to Athgaon	14	4 lanes undivided Two-way	2	13:00 hrs. to 14:00 hrs.
Bharalumukh to Jalukbari	14	4 lanes undivided Two-way	2	
Bharalumukh to Fatasil Ambari	7	2 lane undivided Two-way	2	
Jalukbari to Bharalumukh	14	4 lanes undivided Two-way	2	

(Source: Compiled by Consultants)



Figure 5-90 Queuing Length of Intersection 13

Bharalumukh Junction is a 4-Arm junction and the total daily traffic at the Junction is **76018** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-138.

Table 5-138 Peak hour traffic at Bharalumukh Junction

<b>Peak Hour</b>	<b>13:00 to 14:00</b>
Peak Hour Traffic (PCU/hr)	7135

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-139 Veh/Day at Bharalumukh Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Bharalumukh junction	3444	74341

(Source: Compiled by Consultants)



**5.13.2.14 Intersection - 14 (Kachari Junction)***Table 5-140 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Kachari to Highcourt	7	2 lane undivided Two-way	2.5	09:00 hrs. to 10:00 hrs.
Facny to Uzanbazaar				

*(Source: Compiled by Consultants)**Figure 5-91 Queuing Length of Intersection 14*

Kachari Junction is a 4-Arm junction and the total daily traffic at the Junction is **5832** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-141.

*Table 5-141 Peak hour traffic at Kacharii Junction*

Peak Hour	09:00 to 10:00
Peak Hour Traffic (PCU/hr)	821

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-142 Veh/Day at Kachari Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Kachari junction	5379	6325

*(Source: Compiled by Consultants)*

**5.13.2.15 Intersection – 15 (Khanapara Junction)**

Table 5-143 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
GHY Club to Khanapara	14	4 lanes undivided Two- way	4	09:00 hrs. to 10:00 hrs.
NH-37 (Jalukbari to Khanapara)				
Khanapara to Jalukbari				
Khanapara to GS				

(Source: Compiled by Consultants)



Figure 5-92 Queuing Length of Intersection 15

Khanapara Junction is a 3-Arm junction and the total daily traffic at the Junction is **19139** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-144.

Table 5-144 Peak hour traffic at Khanapara Junction

Peak Hour	09:00 to 10:00
Peak Hour Traffic (PCU/hr)	1841

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-145 Veh/Day at Khanapara Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Khanapara junction	7708	18371

(Source: Compiled by Consultants)

**5.13.2.16 Intersection - 16 (Ulubari Junction)**

Table 5-146 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Ulubari to GHY club	14	4 lanes undivided Two-way	2.5	12:00 hrs. to 13:00 hrs.
Ulubari to Sarabhati	7	2 lane undivided Two-way		

(Source: Compiled by Consultants)



Figure 5-93 Queuing Length of Intersection 16

Ulubari Junction is a 5-Arm junction and the total daily traffic at the Junction is **6198** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-147.

Table 5-147 Peak hour traffic at Ulubari Junction

<b>Peak Hour</b>	<b>12:00 to 13:00</b>
Peak Hour Traffic (PCU/hr)	612

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-148 Veh/Day at Ulubari Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Ulubari junction	6277	6602

(Source: Compiled by Consultants)

**5.13.2.17 Intersection - 17 (Six miles Junction)**

Table 5-149 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Six miles to Jaynagar	14	4 lanes undivided Two-way	3	16:00 hrs. to 17:00 hrs.
Six miles to Khanapara				
Six miles to Panjabri				
Six miles to Patharquary				

(Source: Compiled by Consultants)



Figure 5-94 Queuing Length of Intersection 17

Six miles Junction is a 3-Arm junction and the total daily traffic at the Junction is **40628** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-150.

Table 5-150 Peak hour traffic at Six miles Junction

<b>Peak Hour</b>	<b>16:00 to 17:00</b>
Peak Hour Traffic (PCU/hr)	3870

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-151 Veh/Day at Six miles Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Six miles junction	12470	41660

(Source: Compiled by Consultants)

**5.13.2.18 Intersection - 18 (Basistha Junction)***Table 5-152 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Beltola to Basistha	14	4 lanes undivided Two-way	3	09:00 hrs. to 10:00 hrs.
Basistha chariali to Beltola				

*(Source: Compiled by Consultants)**Figure 5-95 Queuing Length of Intersection 18*

Basistha Junction is a 4-Arm junction and the total daily traffic at the Junction is **20271** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-153.

*Table 5-153 Peak hour traffic at Basistha Junction*

<b>Peak Hour</b>	<b>09:00 to 10:00</b>
<b>Peak Hour Traffic (PCU/hr)</b>	<b>2264</b>

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-154 Veh/Day at Basistha Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Basistha junction	14734	21280

*(Source: Compiled by Consultants)*

**5.13.2.19 Intersection - 19 (Lokhra Junction)***Table 5-155 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
GHY city to Lokhra	7	2 lane undivided Two-way	4	17:00 hrs. to 18:00 hrs.
Lokhra to GHY city				
Khanapara to Jalukbari	14	4 lanes undivided Two-way	3	

*(Source: Compiled by Consultants)**Figure 5-96 Queuing Length of Intersection 6*

Lokhra Junction is a 4-Arm junction and the total daily traffic at the Junction is **6226** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-156.

*Table 5-156 Peak hour traffic at Lokhra Junction*

<b>Peak Hour</b>	<b>17:00 to 18:00</b>
Peak Hour Traffic (PCU/hr)	649

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-157 Veh/Day at Lokhra Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Lokhra junction	6498	6574

*(Source: Compiled by Consultants)*



### 5.13.3 Outer Cordons

#### 5.13.3.1 Intersection - 1 (9th Mile Junction)

Table 5-158 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
GHY to Nagaon	14	4 lanes undivided Two-way	4	10:00 hrs. to 11:00 hrs.
Nagaon to GHY				

(Source: Compiled by Consultants)



Figure 5-97 Queuing Length of Intersection 1 (Outer Cordon)

9<sup>th</sup> Mile Junction is a 3-Arm junction and the total daily traffic at the Junction is **13886** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-159.

Table 5-159 Peak hour traffic at 9<sup>th</sup> Mile Junction

Peak Hour	10:00 to 11:00
Peak Hour Traffic (PCU/hr)	1316

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-160 Veh/Day at 9<sup>th</sup> Mile Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
9 <sup>th</sup> Mile junction	10847	12906

(Source: Compiled by Consultants)

**5.13.3.2 Intersection - 2 (Goalpara to GHY City Junction)***Table 5-161 Intersection 6 Traffic Congestion Details*

<b>Road</b>	<b>C. W. Width (m)</b>	<b>No. of Lanes</b>	<b>Shoulder + Footpath Width (m)</b>	<b>Peak Congestion Hours</b>
<b>GHY to Goalpara</b>	7	2 lane undivided Two-way	2.5	12:00 hrs. to 13:00 hrs.
<b>Goalpara to GHY</b>				

*(Source: Compiled by Consultants)**Figure 5-98 Queuing Length of Intersection 2 (Outer Cordon)*

Goalpara to GHY City Junction is a 3-Arm junction and the total daily traffic at the Junction is 10032 PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-162.

*Table 5-162 Peak hour traffic at Goalpara Junction*

<b>Peak Hour</b>	<b>12:00 to 13:00</b>
<b>Peak Hour Traffic (PCU/hr)</b>	<b>1008</b>

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-163 Veh/Day at Goalpara Junction*

<b>Location</b>	<b>Minor Road (Veh/day)</b>	<b>Major Road (Veh/Day)</b>
Goalpara junction	5727	8630

*(Source: Compiled by Consultants)*



**5.13.3.3 Intersection - 3 (Bahaita to Silla Junction)***Table 5-164 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Bahaita to Silla	7	2 lane undivided Two-way	3	09:00 hrs. to 10:00 hrs.
Silla to Bahaita				

(Source: Compiled by Consultants)

*Figure 5-99 Queuing Length of Intersection 3 (Outer Cordon)*

Bahaita to Silla Junction is a 4-Arm junction and the total daily traffic at the Junction is 21837 PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-165.

*Table 5-165 Peak hour traffic at Bahaita Junction*

<b>Peak Hour</b>	<b>10:00 to 11:00</b>
Peak Hour Traffic (PCU/hr)	2276

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-166 Veh/Day at Bahaita Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
9 <sup>th</sup> Mile junction	14036	18700

(Source: Compiled by Consultants)

**5.13.3.4 Intersection - 4 (Dadara Hajo to GHY City Junction)**

Table 5-167 Intersection 6 Traffic Congestion Details

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
GHY City to Dadara Hajo Dadara Hajo to GHY	7	2 lane undivided Two-way	4	09:00 hrs. to 10:00 hrs.

(Source: Compiled by Consultants)



Figure 5-100 Queuing Length of Intersection 4 (Outer Cordon)

Dadara Hajo to GHY City Junction is a 3-Arm junction and the total daily traffic at the Junction is **12213** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-168.

Table 5-168 Peak hour traffic at Dadara Hajo Junction

Peak Hour	09:00 to 10:00
Peak Hour Traffic (PCU/hr)	2381

(Source: Compiled by Consultants)

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

Table 5-169 Veh/Day at Dadara Hajo Junction

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Dadara Hajo junction	8553	11887

(Source: Compiled by Consultants)

**5.13.3.5 Intersection - 5 (Ghy to Mandkata Junction)***Table 5-170 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
GHY to Mandkata	7	2 lane undivided Two-way	4	12:00 hrs. to 13:00 hrs.
Mandkata to GHY				

*(Source: Compiled by Consultants)**Figure 5-101 Queuing Length of Intersection 5 (Outer Cordon)*

Mandkata Junction is a 4-Arm junction and the total daily traffic at the Junction is **6663** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-171.

*Table 5-171 Peak hour traffic at GHY to Mandkata Junction*

<b>Peak Hour</b>	<b>12:00 to 13:00</b>
Peak Hour Traffic (PCU/hr)	906

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-172 Veh/Day at GHY to Mandkata Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
GHY to Mandkata junction	10847	12906

*(Source: Compiled by Consultants)*

**5.13.3.6 Intersection - 6 (Majirgaon to GHY City Junction)***Table 5-173 Intersection 6 Traffic Congestion Details*

<b>Road</b>	<b>C. W. Width (m)</b>	<b>No. of Lanes</b>	<b>Shoulder + Footpath Width (m)</b>	<b>Peak Congestion Hours</b>
GHY city to Majirgaon Majirgaon to GHY city	7	2 lane undivided Two-way	4	09:00 hrs. to 10:00 hrs.

*(Source: Compiled by Consultants)**Figure 5-102 Queuing Length of Intersection 6 (Outer Cordon)*

Majirgaon Junction is a 4-Arm junction and the total daily traffic at the Junction is **3415** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-174.

*Table 5-174 Peak hour traffic at Majirgaon to GHY Junction*

<b>Peak Hour</b>	<b>09:00 to 10:00</b>
Peak Hour Traffic (PCU/hr)	425

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-175 Veh/Day at Majirgaon to GHY Junction*

<b>Location</b>	<b>Minor Road (Veh/day)</b>	<b>Major Road (Veh/Day)</b>
Majirgaon to GHY junction	3648	3616

*(Source: Compiled by Consultants)*

**5.13.3.7 Intersection - 7 (Narengi Junction)***Table 5-176 Intersection 6 Traffic Congestion Details*

Road	C. W. Width (m)	No. of Lanes	Shoulder + Footpath Width (m)	Peak Congestion Hours
Panikhatai to Narengi	7	2 lane undivided Two-way	2.5	14:00 hrs. to 15:00 hrs.
Narengi to Panikhetai				

*(Source: Compiled by Consultants)**Figure 5-103 Queuing Length of Intersection 7 (Outer Cordon)*

Narangi to Panikhatai Junction is a 4-Arm junction and the total daily traffic at the Junction is **4030** PCU. The peak hour and peak hour traffic at the junction is presented in Table 5-177.

*Table 5-177 Peak hour traffic at Narangi Junction*

<b>Peak Hour</b>	<b>14:00 to 15:00</b>
Peak Hour Traffic (PCU/hr)	479

*(Source: Compiled by Consultants)*

The current capacity of junction may be improved by removing encroachment and electricity poles along with geometric improvement, channelization, and signalisation.

*Table 5-178 Veh/Day at Narengi Junction*

Location	Minor Road (Veh/day)	Major Road (Veh/Day)
Narengi junction	3265	4229

*(Source: Compiled by Consultants)*

## 5.14 Non- Motorized Transport System

A major proportion of transportation in Guwahati is held by Non-Motorized Transport system. The usage of cycle and walking as the last mile of connectivity is prominent in the context. The same can be confirmed by the share of walking and Bi-Cycling being 42% i.e 21% for each mode.

Table 5-179 Pedestrian Count at Mid block areas

Mid-block Peak hour Pedestrian Count			
Sl. No.	Location	Peak Hour	Peak Hour Pedestrian Count
1	Paltanbazaar	08.00- 09.00	374
2	Fancybazaar	11.00- 12.00	1051
3	Ganeshguri	02.00- 03.00	1297
4	Maligaon	10.00- 11.00	889
5	Manipur Basti	10.00- 11.00	555
6	Rehabari road	03.00- 05.00	128
7	ML Nehru road	11.00- 12.00	235
8	Silphukuri	06.00- 07.00	69
9	RG Barau road	06.00- 07.00	430

(Source: Compiled by Consultants)

Table 5-180 Pedestrian Count at Important Junction

Junction Peak hour Pedestrian Count			
Sl. No.	Location	Peak Hour	Peak Hour Pedestrian Count
1	Basistha	08.00- 09.00	1771
2	Guwahati club	02.00- 03.00	1337
3	Nepali mandir	10.00- 11.00	790
4	Netaji Chowk	11.00- 12.00	2982
5	Ulubari	06.00- 07.00	1666
6	Ganeshguri	03.00- 05.00	2222
7	Vishal mall	02.00- 03.00	783
8	Zoo Road Tinali	10.00- 11.00	683

(Source: Compiled by Consultants)

As per IRC and Urban Street Code, it is recommended to have a minimum footpath width of 1.5m. However, a majority of area in the Guwahati region lacks proper NMT facility. In a majority of the cases huge pedestrian traffic and Bicycle traffic volume is observed along the links and intersections within the core areas – as walking and bi-cycling is predominant modes of movement. Most of the links have adequate footpaths on both sides to accommodate the high pedestrian volume but majority of them observed encroached upon by unauthorized street vendors.



Also, encroachment on footpaths by local vendors and commercial facility owners forces pedestrians to move along the carriageway and also decrease width for proper movement of cyclist.



**Basistha**



**Ganeshguri**



**Fancy Bazar**



**Fancy Bazar**



**Pan Bazar Market**



**RGB Road**

It clearly indicates the road which are dominated by high pedestrian and cyclist footfall are in dire need for pedestrian friendly walkways and dedicated bi-cycle track with robust street infrastructure and enough walkway width. It can be clearly observed from the images mentioned above that the pedestrian crossings and vehicular movements are at high risk and seems unsafe as there is no enough control and regulations been followed, hence there are high chances of conflict between these two modes of traffic.

The major deficiencies are:

1. Inadequate/irregular riser and tread
2. Poor surface condition
3. Poor illumination
4. Lack of railing and landing facilities for long flight of steps
5. No pedestrian crossing facility and zebra crossing marks
6. Inadequate traffic control infrastructure on major nodes

As walking is the effective Non-Motorized Transit (NMT) mode, management of pedestrian facilities along with steps and accessibility on footpaths can significantly boost the patronage for NMT movement within GMPA.

### 5.14.1 Foot Over Bridges

#### GUWAHATI MASTER PLAN

Foot Overbridge : GMC

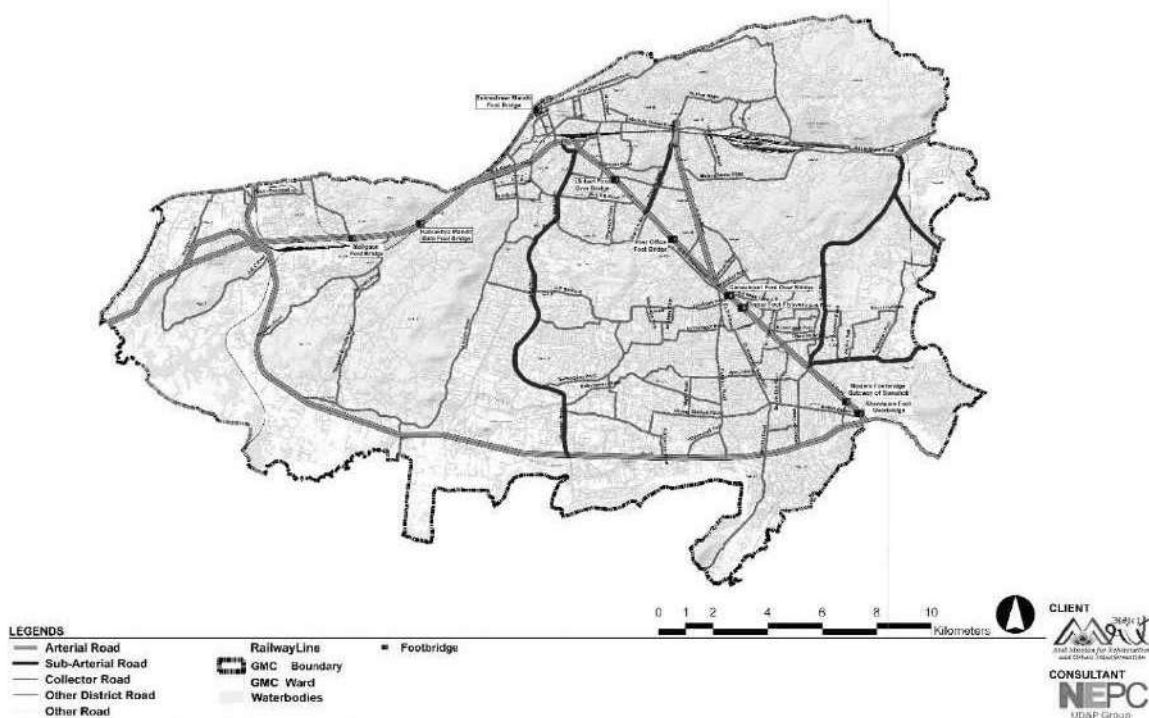
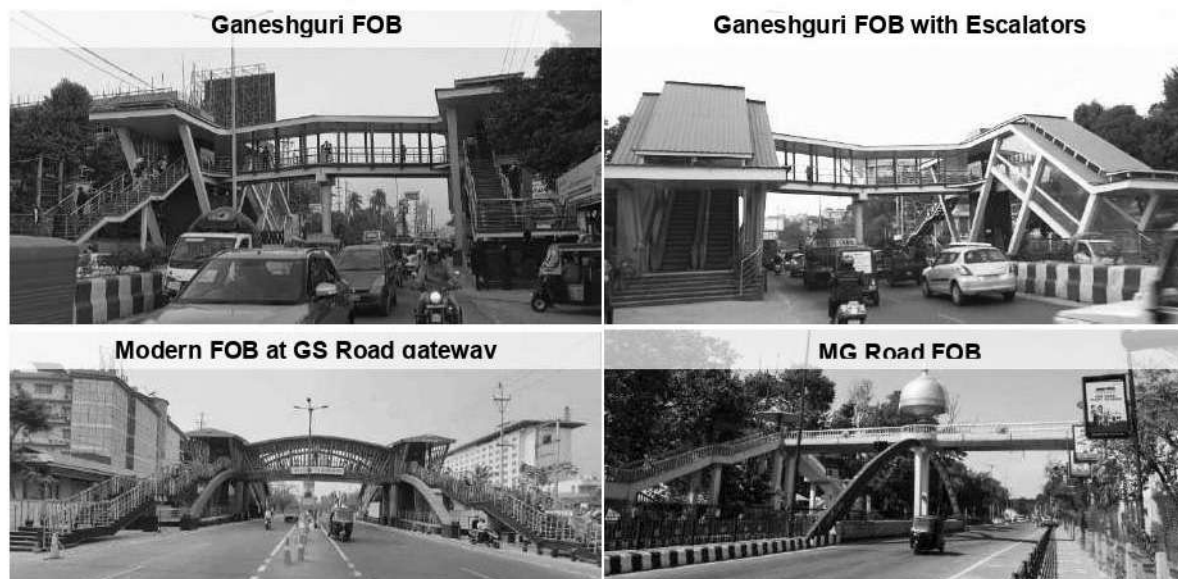


Figure 5-104 FOBs in Guwahati Planning Area

Presently, Guwahati observes total 9 FOBs in the city to facilitate pedestrian for safe crossing at highly congested and busy arterial roads like, GS Road, AT Road and MG Road. Out of nine FOBs, two are at AT road, one at MG road and six at GS Road.





### 5.14.2 Bicycle Track

Presently, there is recently developed one dedicated bicycle track on the Southern embankment road of Basistha River, called GG road connecting Lokhra Road and Hatigaon Road by PWD Department. Still there are many roads observed with high non-motorized activity with lack of bi-cycle track all across Guwahati.



Figure 5-105 Existing Cycle Track on Basistha Embankment GG Road

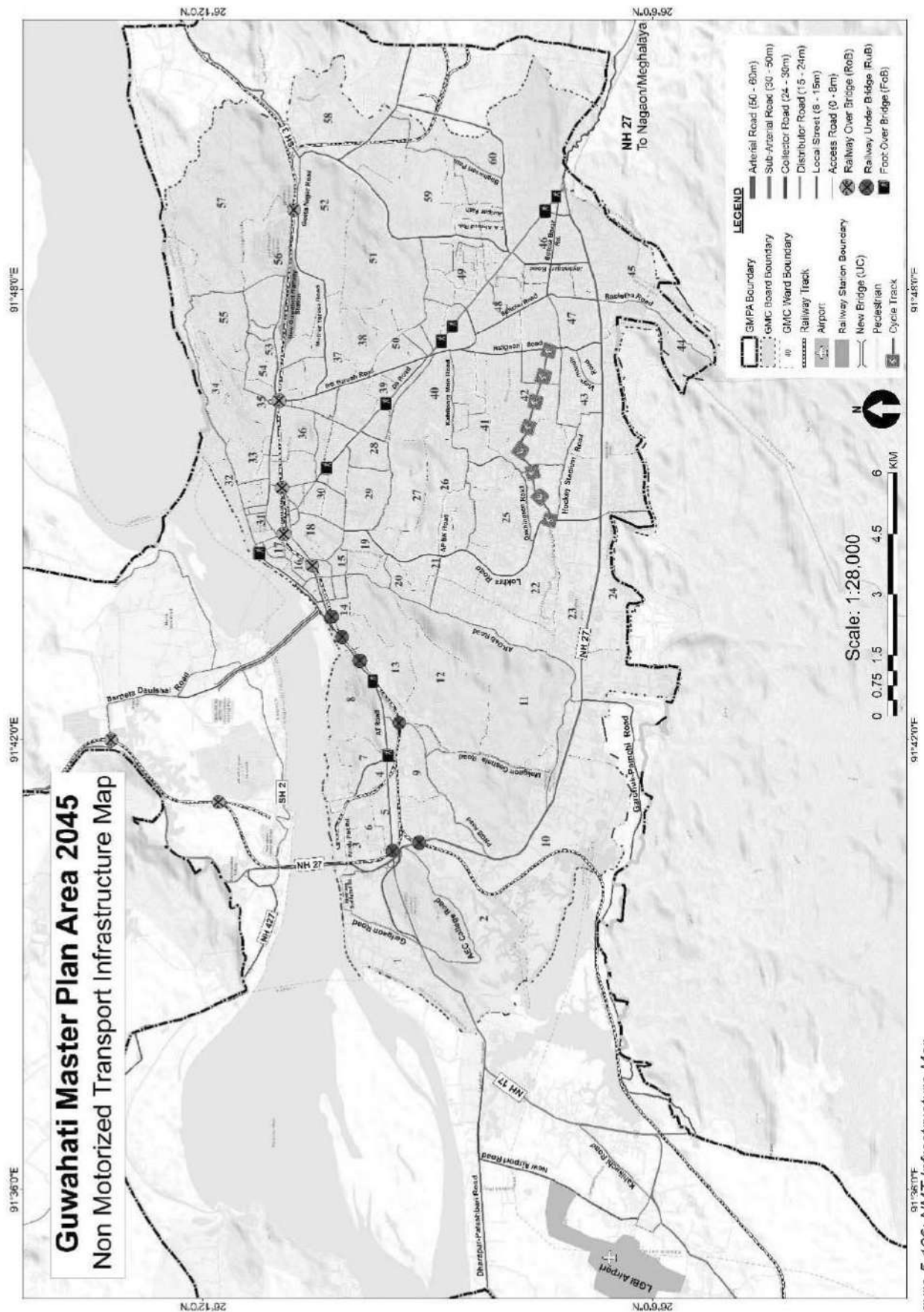


Figure 5-106: NMT Infrastructure Map

## 5.15 Parking Infrastructure

The parking areas are an important component in the urban transportation network. The parking areas become very important in the Central Business District areas (CBD) and public activity area, where the traffic movement is heavy. On street parking is found all over Guwahati and usually observed spill over to other use areas like road carriageway, footpaths and open spaces. In turn they affect safety and environmental quality. Parking characteristics within the town vary by areas, by land use activities and by time period. In residential areas it is by private vehicles and of long-term duration during the night hours. In central areas it is of mixed type – private and public vehicles, passenger and goods vehicles and of short term and long-term needs. In warehousing and wholesale market areas it is predominantly of LCVs and goods vehicles.

### 5.15.1 Parking Survey

Total 15 identified spots with high parking demand and major uncontrolled unauthorised parking trend were surveyed and found the below mentioned facts.

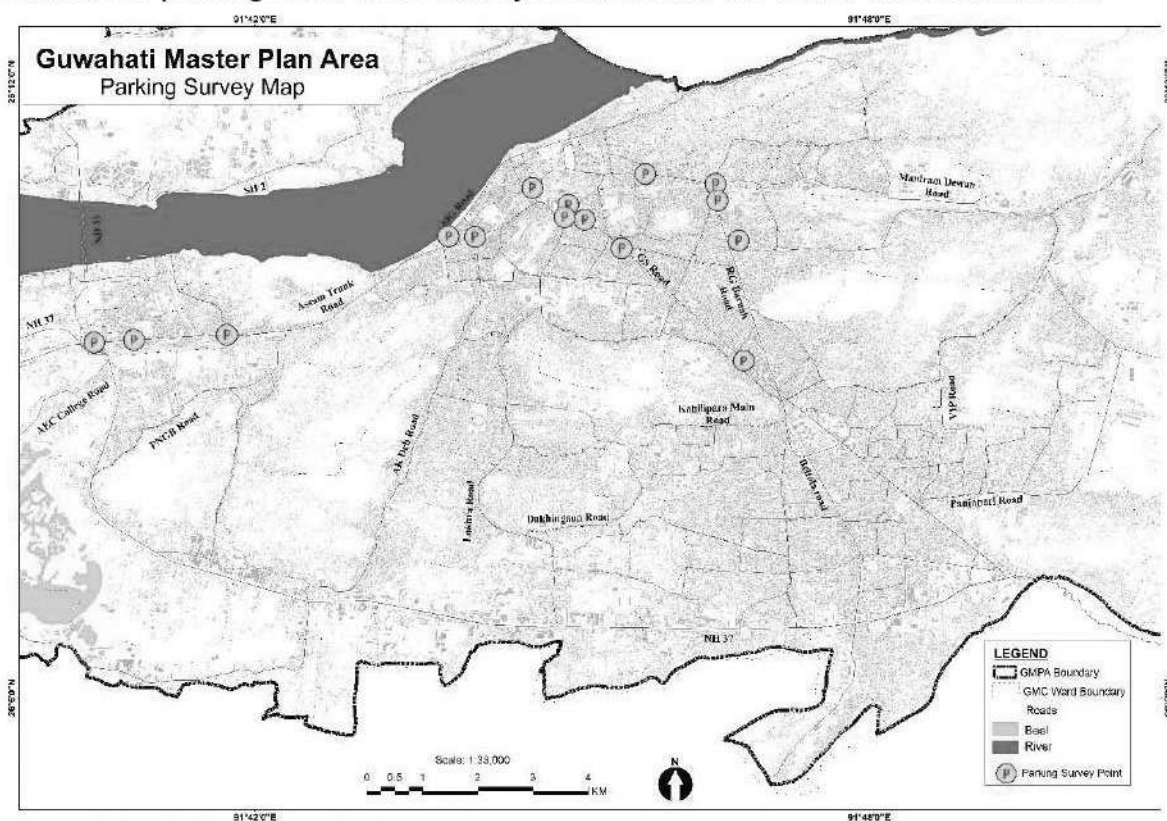


Table 5-181 Parking occupancy trend at 15 identified places withing GMC area

Location-wise Parking Duration						
Sl. No.	Location	< 0.5 hr	0.5 -1 hr	1 -2 hr	2 -3 hr	>3 hr
1	Bharalumukh	98%	2%	0%	0%	0%
2	Paltan bazar	91%	5%	4%	1%	0%
3	Chandmari Road	82%	12%	5%	1%	1%
4	Ulubari	79%	15%	5%	0%	0%
5	Christian basti	88%	11%	1%	0%	0%
6	ML Nehru Road	78%	9%	8%	4%	1%
7	Mother Teresa Rd	78%	15%	5%	1%	1%
8	Jalukbari	30%	39%	15%	9%	6%
9	Adabari	62%	18%	12%	5%	3%
10	Maligaon	64%	14%	11%	5%	5%
11	Athgaon	82%	11%	6%	1%	0%
12	RG Baruah Road	83%	11%	4%	2%	1%
13	Silphukuri	72%	17%	7%	2%	1%
14	Manipurbasti	65%	17%	14%	3%	1%
15	Rehabari Road	67%	13%	12%	5%	4%

(Source: Consultant Compilation)

Table 5-182 Categorised vehicular occupancy at 15 identified places within GMC area

Sl. No.	Location	Composition of parked vehicles					Total
		TW	Car/Van	Auto	Bus	Truck/LCV	
1	Bharalumukh	12%	70%	4%	13%	1%	100%
2	Paltan bazaar	8%	53%	21%	6%	11%	100%
3	Chandmari Road	11%	66%	9%	2%	13%	100%
4	Ulubari	11%	51%	29%	0%	8%	100%
5	Christ ianbasti	10%	76%	10%	0%	5%	100%
6	ML Nehru Road	14%	72%	5%	0%	9%	100%
7	Mother Teresa Road	8%	59%	13%	2%	19%	100%
8	Jalukbari	8%	20%	5%	38%	28%	100%
9	Adabari	8%	36%	7%	10%	40%	100%
10	Maligaon	19%	34%	16%	0%	30%	100%
11	Athgaon	13%	46%	14%	0%	27%	100%
12	RG Baruah Road	6%	46%	10%	24%	15%	100%
13	Silpukhuri	7%	85%	3%	0%	5%	100%
14	Manipur basti	11%	49%	29%	3%	7%	100%
15	Rehabari Road	20%	53%	15%	1%	12%	100%
<b>Average</b>		<b>11%</b>	<b>54%</b>	<b>12%</b>	<b>7%</b>	<b>15%</b>	<b>100%</b>

(Source: Consultant Compilation)

As evident from the above table, the parallel parking spaces on Paltan Bazar road and Beltola Road is highly demanded and its unavailability leads to sever encroachment on street, that on Maligaon Road, Athgaon point road, Siphukuri and Rehabari Road, no designated parking space available which leads to encroachment on most patches.

After haphazard parking of vehicles, only about 5m width of carriageway remains accessible for vehicular movement at the mentioned locations.

On-street Parking has been observed at various locations like Jalukbari, Nehru road, Cristian Basti, Ulubari, and Chandmari Road in Guwahati Planning Area leading to massive congestion and decreasing the road capacity.

Presently, the unauthorized on-street parking has been practiced in major part of Guwahati town area. Places of where heavy traffic movement or pedestrian activity is observed are also encroached with parking. Some streets observed spill over with haphazard parking and therefore the accessibility on carriageways remain encroached and insufficient which leads to frequent traffic jams and booming with congestions.

Considering the issues local Govt. and ULBs have identified on-street and off-street parking facilities within the high demanded areas of the city to ease out parking issues. Some Multilevel parking, Paid and Free parking zones have been declared by Govt.

### 5.15.2 Existing Parking Facility

At present the old jail complex near Fancy Bazar within CBD is temporarily used for two-wheeler and Four-wheeler parking area. To add to this, around 0.54 hectare of multilevel parking space in Paltan Bazar ASTC premises and other two multilevel parking of 0.35 hectare and 0.65 hectare are located at Pan Bazar near MMCH Hospital and another in front of Shraddhanjali Kanan at R G Baruah road.

The Multilevel Automated Car Parking which has been constructed by GMDA in front of Shraddhanjali Kanan at R.G. Baruah Road at a project cost of Rs. 14.38 Crore is funded under Special Plan



Multilevel parking at RGB Road

Assistance. The project is completed in all respect and fully functioning to public. It



has the capacity to accommodate 302 four-wheeled vehicles and 25 two-wheeled vehicles at a time.

The Multi-Level Car Parking System is a 6 Level 8 Grid Overground Puzzle Parking System and maximum 43 cars can be parked on the pallet per Module. The ground level has 07 pallets capable of parking 07 cars at any point in time. These pallets can move horizontally Left to Right and Right to Left. First, Second, Third, Fourth & Fifth Floor Pallets/ Trolleys can move horizontally and vertically and can accommodate 36 cars. The system can be controlled from the Operating Panel mounted/ fixed/ located on the Left front corner of the column at the entry level on the ground floor. There are Sensors located on the front side of the system which will be activated if there is any obstructions in its path and bring the system to a halt while operation.



The four-storied Assam State Transport Corporation (ASTC) multi-level car parking unit, financed under Union ministry of development of the northeast region, has capacity of 150 cars at present. In addition to benefitting vehicle owners, who can now park their four-wheelers safely, the new parking facility on the ASTC premises which is accommodating vehicles that used to be parked on the road, resulting in traffic snarls around Paltan bazar.

Moreover, the automated multi-level car parking located at Pan Bazar near MMCH hospital completed in year 2021 has the capacity of accommodating 240 cars and was built involving a financial outlay of Rs. 11 crore. The new project is built with vision to add convenience to the city dwellers located at the heart of the city and this new



automated multilevel car parking would greatly reduce the problem of car parking for the people going to Pan bazar or Fancy bazar areas.

Apart from the above-mentioned paid parking area, the on-street parking also practiced in the entire CBD area where heavy traffic movement or public activity is observed. The onstreet parking of vehicles coming within core town area are mainly due to recreation and tourism activities, Collages, Parks and government buildings. The on-street parking of vehicles coming within fancy bazar are mainly due to trade and commercial activities. GMC has recently notified on-street and off-street parking within the span of Municipality area. There are 53 such Municipal identified parking area designated for public parking within GMC area of planning area. Out of them, 43 declared free parking zones and 10 are paid parking spaces. The detailed list elaborated further.

*Table 5-183 List of Parking Slots which are made free for Public Use*

SL. No.	Parking Lot No.	Name of Road	Parking Area
1	4	<b>H.B. Road</b>	From Cotton Collegiate School Road junction (opp. BSNL office) to Panbazar Police point, South side, Angular Parking
2	6	<b>A.R.B. Road</b>	From Commissioner's point to Don Bosco School (One side), Angular Parking
3	7	<b>G.S. Road</b>	From Dihang Arcade to Orion Palace, East side, Parallel Parking
4	8	<b>G.N.B. Road</b>	From Paradise Hotel to Guwahati Sadhu Ghar, South Side, Parallel Parking
5	9	<b>A.T. Road</b>	From Col J. Ali Road Junction (Near Police Reserve Entrance) to Viswaratna Hotel (police Reserve Side), Parallel Parking
6	10	<b>G.S. Road</b>	From Pepe jeans to News Live, West Side, Parallel Parking
7	11	<b>G.S. Road</b>	From Pragati Manor to Wills Lifestyle, West Side, Parallel Parking
8	12	<b>G.S. Road</b>	From Guwahati Sanitary to Silver Square, West Side, Parallel parking
9	13	<b>G.S. Road</b>	From Sri Mangala Santosh Store to Dona Planet, West Side, Parallel Parking
10	14	<b>G.S. Road</b>	From Panasonic (near Srinagar Point) to Marble Plaza (near Hanu Boro Point), East Side, Parallel Parking
11	15	<b>Dispur Super Market</b>	Guwahati Municipal Corporation Office Division-V Ground
12	16	<b>H.B. Road</b>	From Panbazar Police Point to City Pharmacy, North Side, Angular Parking
13	17	<b>G.S. Road</b>	From Pantaloon entrance point to UCO Bank (excluding city bus stop) Eastside, Parallel Parking
14	18	<b>A.T. Road</b>	From Gate No. 6 to Gate No.8 (KRB Road), South Side, Parallel Parking
15	20	<b>A.K. Azad Road</b>	From near Chief Conservator Forest Office to Rehabari Namghar (one side), Angular Parking
16	21	<b>G.S. Road</b>	From Times of India office to Saharia's Path Lab (Both side), Parallel Parking
17	22	<b>Pandu Port Road</b>	Bara Bazar from Sankar Jewellery to Pandu College (Both Side), Parallel Parking

18	24	<b>Danish Road</b>	From Central Police Hospital entrance to S.S. Road Junction, Parallel Parking
19	25	<b>Beltola Basistha Road</b>	From Central Nursing home (Survey) to Beltola Tinali (Both Side), Parallel Parking
20	26	<b>G.S. Road</b>	From Kanak Lata Path to Nandy Rabha Path, East Side, Parallel Parking
21	27	<b>Express Highway</b>	From Union Bank to IDBI Bank, East Side, Parallel Parking
22	28	<b>Hengrabari Road</b>	From NCD College to Director of Health Service Office (One side along the footpath), Parallel Parking
23	29	<b>Jaswant Road</b>	From M.G. Road junction to Saraswati Road junction (one side), Parallel Parking
24	30	<b>G.S. Road</b>	From Prime Bake's Special to Sangam Steel Hardware (near Hanu Boro Point), West side, Parallel Parking
25	31	<b>Betkuchi</b>	Betkuchi Wholesale Fish Market (Both Side)
26	32	<b>G.S. Road</b>	From Sixmile Flyover landing (Dispur side) Kamrup Auto electric house to Opposite point kanak Lata Path, West Side, Parallel Parking
27	33	<b>S.J. Road</b>	From Vision Hospital to Shiv Mandir (One Side) in rotation, Parallel Parking
28	34	<b>G.N.B. Road</b>	From Abhishek Motors to Archies Gallery, South Side, Parallel Parking
29	35	<b>G.S. Road</b>	From Durgaram Das complex (Hitech Motors) to Ajoy Hotel, West Side, Parallel Parking
30	36	<b>G.S. Road</b>	From Krishi Bhawan to Opposite Point Asha Bora Foundation, West Side, Parallel Parking
31	37	<b>R.G. Boruah Road</b>	From Dainik Janambhumi to Srinagar Path Junction (Both Side), Parallel Parking
32	38	<b>B.Baruah Road</b>	From SBI Bank ATM to Das Photostat, South Side
33	39	<b>G.S. Road</b>	From Bhat Ghar to Assam Valley, West Side
34	40	<b>Beltola Basistha Road</b>	From Point Opposite Sankardev Netralaya office to AG office junction, East Side and from Old Netralaya point to Case Construction, West Side, Angular Parking
35	41	<b>G.N.B. Road</b>	From RS Trading (Rohini Apartment) to Paradise Hotel, South Side, Parallel Parking
36	42	<b>Manipur East Road</b>	From Kiranshree Hotel point to Kalimandir (K.C. Sen Road Tinali)
37	43	<b>VIP Road (Panjabari Road)</b>	From Pratiksha Hospital entrance point to Jonaki Path entrance (in front of express car wash center), (both Side)
38	44	<b>Patharkuchi Road</b>	From Patharkuchi road point to new bazar bridge, both side Parallel Parking, Athgaon
39	46	<b>Sati Joymoti Road</b>	From Chabipool Point upto sati jaymati road- KC road junction (In front of Kabarasthan), Left side parallel Parking, Athgaon
40	47	<b>Md. Tayabullah Road</b>	From high court east to Md. Tayabulla Road - GNB Road Crossing, Dighalipukhuri Side
41		<b>Ulubari Flyover</b>	Ulubari Flyover
42		<b>Sixmile Flyover</b>	Sixmile Flyover
43		<b>Athgaon</b>	Athgaon Flyover

Table 5-184 Notified Paid Parking places within GMC Area

Sl. No.	Parking Area
1	Cotton Collegiate School Road Parking
2	Dr. J.C. Das Road (Phulgoli) Parking
3	From Baptist Church to Dr. JC Das Road Junction (Bapist Church Side)
4	From Khubchand point to sikh temple point, left side parallel parking, Fancy Bazar
5	Ganeshguri Flyover
6	Bhangagarh Flyover
7	Basement Parking, Fancy bazaar GMC complex
8	Adabari Bus Terminus
9	Lachit Ghat Parking, Machkhowa
10	R.P. road from in fashion to life line Medicos, Parallel parking (B.K. Tower)

Maps represented further describes spatial distribution of existing paid and free parking facilities within GMC area.

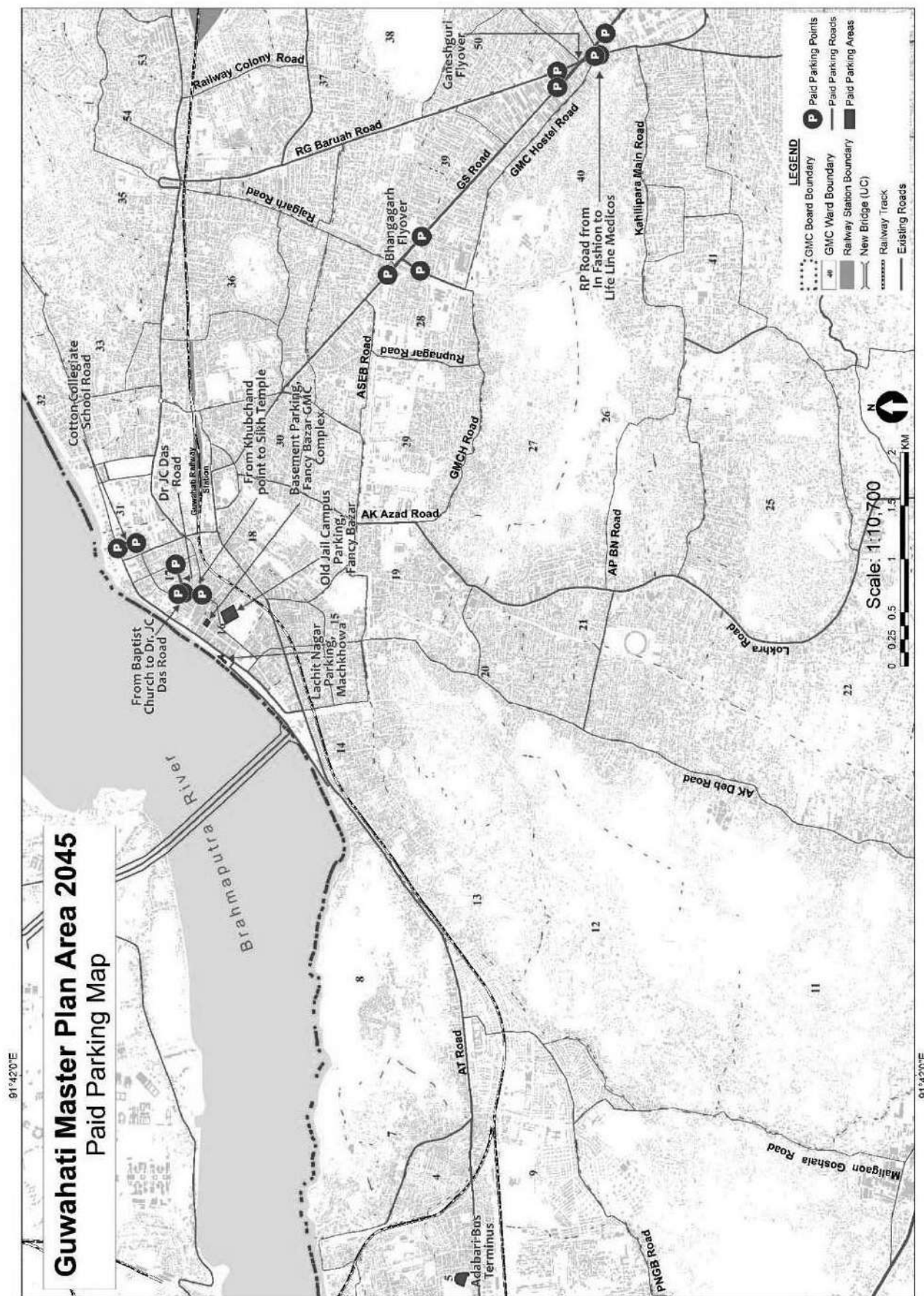


Figure 5-108: Existing Paid Parking Locations

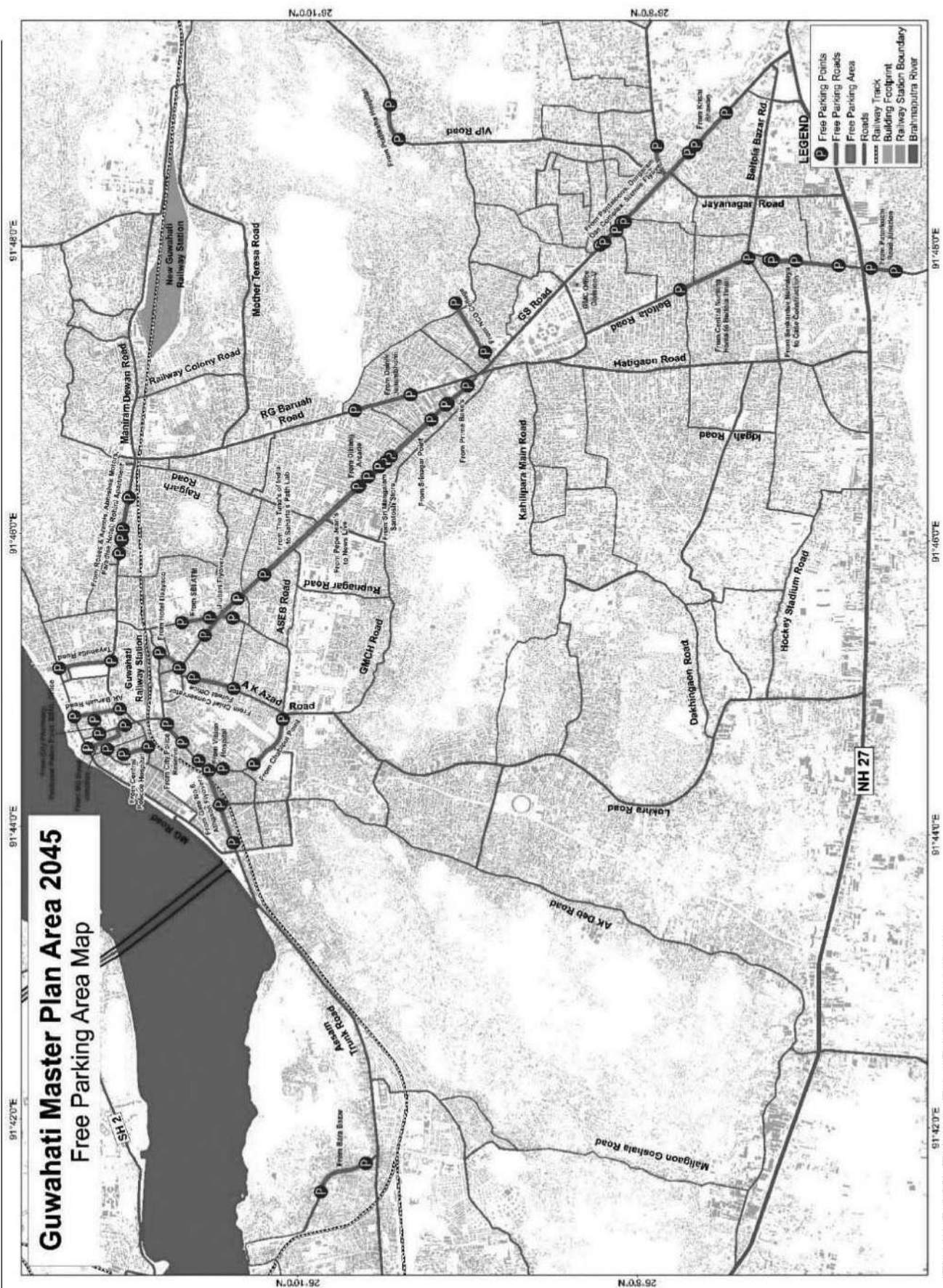


Figure 5-109: Existing Free Parking locations



## **5.16 Issues**

### **5.16.1 Core City Area (CBD)**

Core city area being the oldest settlement and the hub of multiple activities like commercial (both retail & wholesale), educational, recreational, government institutions etc., attracts a lot of vehicular traffic around the clock. This has led to multiple traffic & transportation related issues within the CBD area which is also rich in cross cultural heritage. Major issues which are deteriorating the traffic conditions within the boulevard area are problems associated with lack of planned parking, pedestrian traffic conflicts, lack of traffic management systems, encroachments of footpaths & road right of ways.

### **5.16.2 Parking**

As mentioned earlier, there are some designated parking areas in the Guwahati Planning Area. At present, the old jail complex in Fancy bazar is temporarily used as parking area and the paved area at Lachit ghat on south Brahmaputra riverfront is used for both four-wheeler and two-wheeler parking. There are 3 four-wheelers multilevel paid parking places around the Guwahati. Apart from the above-mentioned paid parking areas, on street parking is practiced in the entire Core city area where heavy traffic movement is observed. The on-street parking of vehicles coming within Uzanbazar is mainly due to recreation, tourism activities and work purpose due to the presence of schools and government buildings. The on-street parking of vehicles coming within Garbhanga is mainly due to health care and trade and commerce activities. The on-street parking reduces the effective carriageway width thereby inducing congestion. Need for additional parking area is keenly felt in the city because of the recreation activities, tourism activities, commercial activities and due to the presence of schools and government buildings.

### **5.16.3 Pedestrian Issues**

Walkability is an important component of any tourist area. Guwahati being a tourist place, pedestrian facilities such as foot paths are to be provided for the smooth flow of the pedestrians/tourists. In the Planning area, it is observed that many of the roads are devoid of footpaths which causes conflicts between pedestrians and vehicles and there are encroachments in footpaths in certain areas. In Guwahati, there is substantial amount of walk trip especially in the Core city area since it is a tourist place and the main commercial hub.



#### 5.16.4 Junctions without traffic signal

Many traffic intersections observed with insufficient traffic control facility. The below mentioned are junction with non-working traffic signals. Resulting in unnecessary traffic jams and chaos in the pick hours. Unavailability of traffic signals generates more requirement of traffic brigade to control and regulate traffic at major intersections of city.

- Various junctions are performing without traffic signals in town like Lokhra intersection, Basistha intersection, Beltola- NH intersection, Beltola Tiniali, Junctions on AK Deb Road, MG Road intersections, AT Road intersections, Maniram Dewan Road intersections, Narengi Junction, etc.
- The marked spots on map are junctions/ intersections without traffic signal

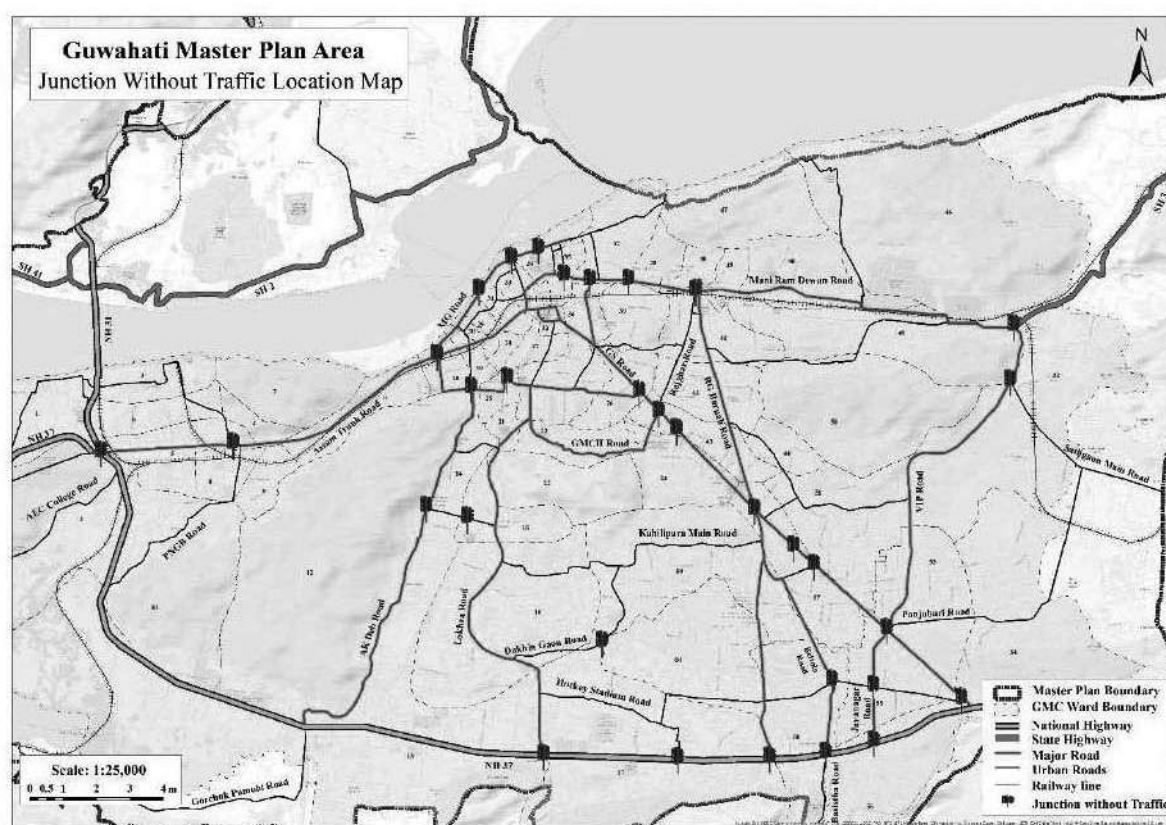


Figure 5-110 Junctions/Intersections without traffic signals

### 5.16.5 Bottleneck Points in Guwahati Planning Area

The conurbation area being mostly urbanized, face similar issues which area already mentioned in this chapter. Key issues found across the conurbation area are not upto the mark designed intersections, lack of road hierarchy, absences of dedicated sufficient parking space around key institutions & nodes, bottlenecks along major roads and pedestrian traffic conflict issues.

There are 28 bottleneck points identified within Guwahati Planning area out of which 12 bottle neck points are within core area of Guwahati as shown in the figure below. The bottleneck points within urban area cause delay to the commuters to reach their destination in time. There are 7 parallel bottle necks observed at road-railway intersection which are barrier regulated and this creates heavy congestion and long traffic queues in daily pick hours. The bottleneck areas in the Planning area are highlighted in the figure below. Majority of the bottlenecks are along NH 37 and AT road.



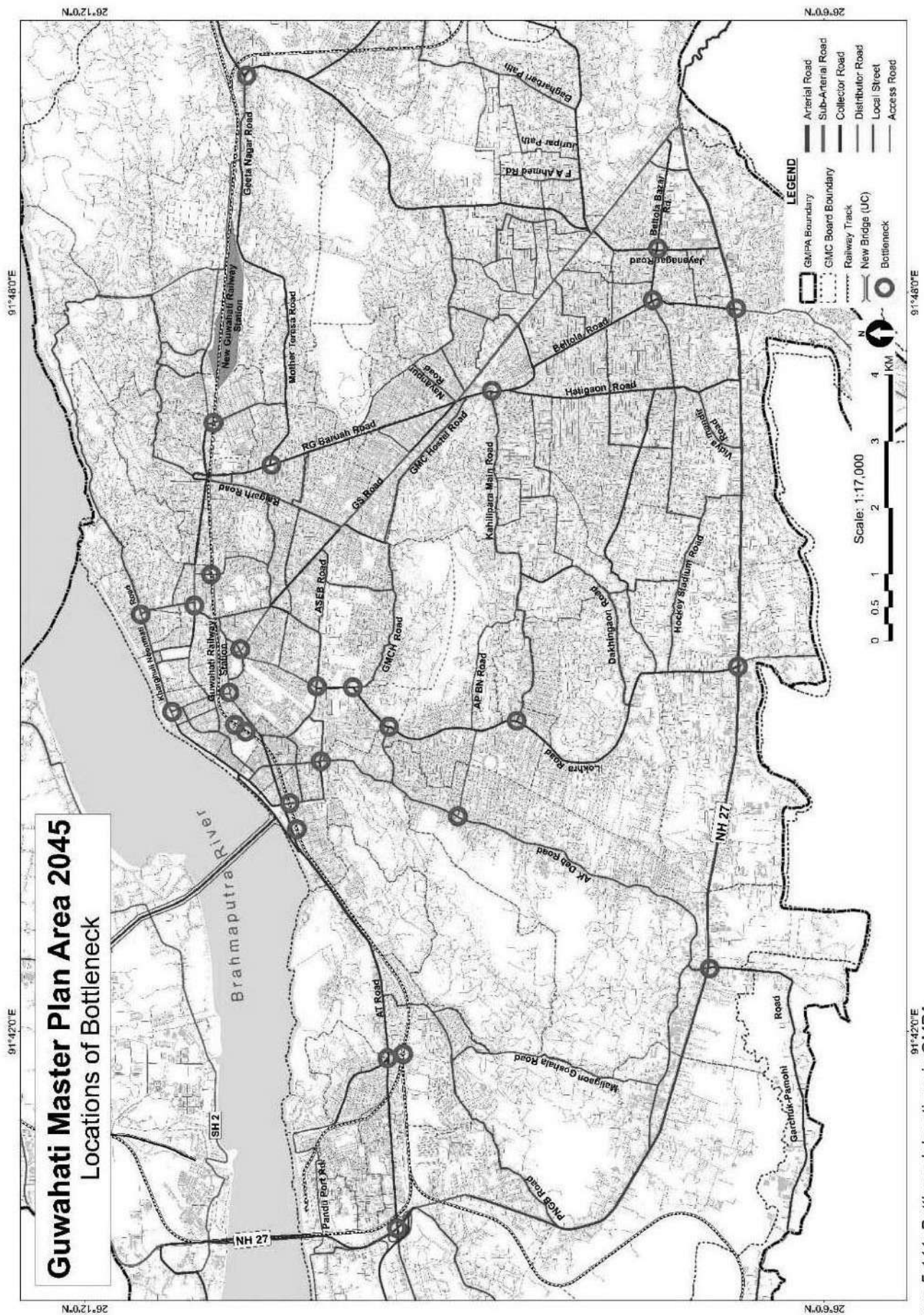
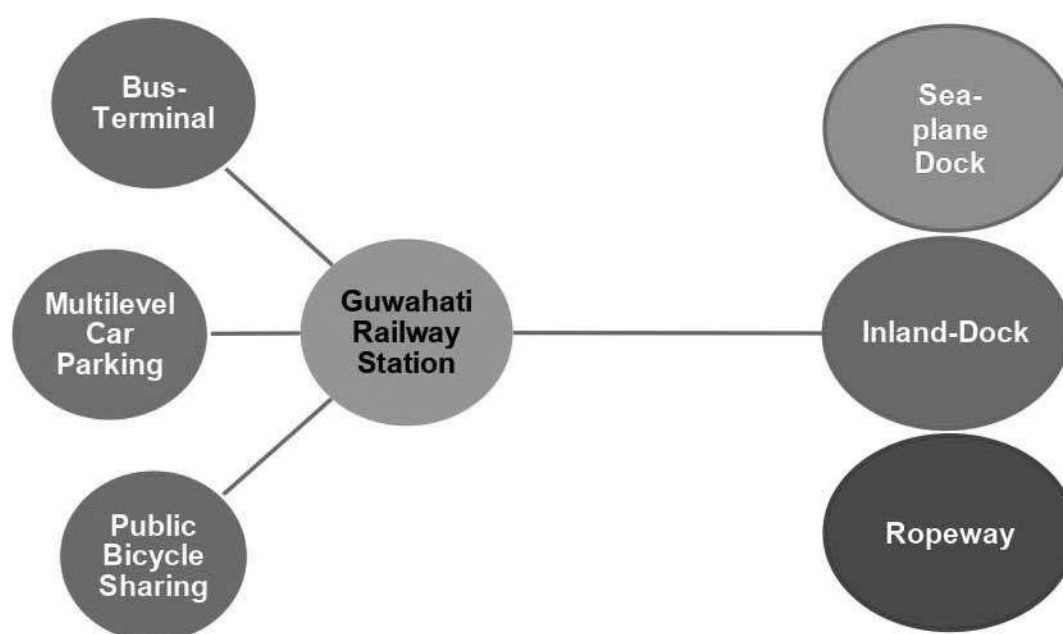


Figure 5-111: Bottleneck locations in GMPA

## 5.17 Proposals and Recommendations

### 5.17.1 Multi Modal Transport Hub

Guwahati is hub to numerous transport modes such as private road transport, rail transport, bus transport, Auto-rickshaw, rope way, sea plane, ferry and inland water ways. The seamless physical integration of all the modes is necessary swift transfer from one mode to other. Hence, a Multimodal Transport Hub integrating railway station, ASCT bus terminal, boat jetty, car parking, sea plane dock area, Auto-stand and ferry area and ropeways, would complement different transport system. The figure illustrates the functional relationship between the different modes of transport in the Multi-Modal Transit Hub.



A Multi-Modal Transit Hub is a transport node that interconnects multiple modes of transport, and consequently, improves the efficiency and speed of movement. The Multi-Modal Transit Hub unites seamless passenger transfers as well as combines it with passenger transit-based activities. It is the spine of a city that serves the most crucial purpose of transportation, becoming a linchpin for an efficient transport system.

The Transit Hub also caters to seamless mobility and an environment for easy flow between public transport and public space to uplift the economic scenario while also creating a social identity for the city. It is not just a starting or ending point of a journey the Multi-Modal Transit Hub also serves as a node for the community that surrounds or resides around the transit hub.



### 5.17.2 Cycle Track and Footpath

Guwahati is boon to have 42% of its trip being non-motorized transport. To further increase the modal share of the non-motorized transport system citywide cycle track and Foot path is being proposed.

The total length of the cycle track is 4.5 km and the minimum width of the dedicated cycle corridor is 1.5 Meters. A dedicated Cycle track, also called separated bike lane or protected bike lane, is a physically marked and separated lane dedicated for cycling that is on or directly adjacent to the roadway but typically excludes all motorized traffic with some sort of vertical barrier.

The segregated bicycle lanes are segregated space allocated in a section of the road for cycle use only. Some physical separation is used to stop motor vehicles from entering the space. In the context of Guwahati the segregated system would be efficient in maintaining the need of the cyclist.



Figure 5-112 Model bicycle track

Also, the raised and uninterrupted foot path network in any city would encourage the walking. Pedestrian crashes are a major road safety problem in developing countries. Footpaths or sidewalks can reduce crash risk by separating vehicles and pedestrians. Also, the raised and grade separated footpath would help in swift and safe movement of the pedestrian. In majority of the stretch the width of the pedestrian walkway is of 1.5 meters in one side. In some of area, with narrow ROW, minimum width of the walkways is 0.80 meters. A illustrative image of the cycle track and the footpath is shown below.

### 5.17.3 Public Bi-Cycle Sharing (PBS)

Public Bicycle Sharing (PBS) systems are a flexible public transport service that involves the creation of a dense network of cycle rental stations. Users can take a cycle from any station and return it to any other station in the system. About 21% of vehicular trips in Guwahati are short trips are via non-motorised transport mode i.e. Cycling and walking. The high proportion of the non-motorised transport mode i.e. Cycling and walking form a huge potential market that can use bicycles to travel. PBS allows citizens the flexibility of renting and sharing bicycles for short trips at nominal rates, without the hassle of maintaining a personal bicycle.



Figure 5-113 Public bicycle sharing dock stand

The proposed PBS would allow users travel shorter distances on bicycles (around 2 kilometres). PBS schemes located at public transport hubs in areas with low connectivity can help expand the reach of these services by providing first- and last-mile connectivity. Additionally, through innovative pricing models like long-term subscriptions, PBS systems provide affordable transit for a wide range of users.

PBS schemes usually have different types of bicycles, including regular, geared, electric or pedal-assist, and different rental models, such as one-time rental, subscriptions and long-term rentals. Municipalities often deploy PBS as a part of citizen-centric services, while transport agencies, whose primary job is increasing ridership, deploy these schemes as feeders to their main transportation modes, such as buses.



Initially, Guwahati could start with PBS system at 65 major locations. The 65 major locations are major activity areas such as schools, colleges, recreation area, shopping area, transport hub, public buildings, and tourist attraction area. The detailed list of probable station and docking stand for the public bicycle sharing or the rental bicycle is provided below.

*Table 5-185 Proposed Public Bicycle Sharing Spots, Phase wise*

<b>Sl. No.</b>	<b>Docking Station Name</b>	<b>Phase</b>	<b>Number of Cycles</b>
1	Digholipukhuri	1st Phase	10
2	Nehru Park	1st Phase	10
3	Guwahati Railway Station	1st Phase	10
4	Planetarium	1st Phase	15
5	Uzan Bazar Park	1st Phase	10
6	Navagraha Temple	1st Phase	10
7	Belle View	1st Phase	10
8	Gandhi Mandap	1st Phase	10
9	BBCH	1st Phase	10
10	Fancy Market	1st Phase	10
11	Shraddhanjali Kanan	1st Phase	10
12	Assam State Zoo	1st Phase	10
13	Nehru Stadium	1st Phase	15
14	Paltan Bazar Bus Stand	1st Phase	10
15	Machkhowa Bus Stand	1st Phase	15
16	Sukreshwar Ghat	1st Phase	10
17	Uzan Bazar Ghat	1st Phase	10
18	Old DC Bunglow	1st Phase	10
19	Lachit Ghat	1st Phase	10
20	Silpukhuri	1st Phase	10
21	Chatrakar Devalaya	1st Phase	15
22	Shanti Bhawan	1st Phase	15
23	Bhangagarh	1st Phase	15
24	Ulubari	1st Phase	15
25	Pragjyotish College	1st Phase	10
26	Barsola Beel	1st Phase	10
27	KFC Point	1st Phase	10
28	Nemcare Point	1st Phase	10
29	Commerce Point	1st Phase	10
30	Botanical Garden	1st Phase	10
31	GNRC Six Mile	2nd Phase	10
32	ISBT	2nd Phase	10
33	Purva Tirupati Sri Balaji Temple	2nd Phase	10
34	Indira Gadhi Athletic Stadium	2nd Phase	15

35	Srimanta Sankardeva Kalashetra	2nd Phase	10
36	Assam Secretariat	2nd Phase	10
37	GMCH	2nd Phase	10
38	Kamakhya Temple	2nd Phase	10
39	Kamakhya Station	2nd Phase	10
40	Science Museum	2nd Phase	15
41	Sri Sankardeva Nethralaya	2nd Phase	15
42	Barsapara Cricket Stadium	2nd Phase	15
43	Adabari Bus Stand	2nd Phase	15
44	Khanapara Bus Stand	2nd Phase	10
45	City Centre	2nd Phase	10
46	Gita Temple	2nd Phase	10
47	Jyoti Chitran	2nd Phase	10
48	Assam Educations Departments	2nd Phase	10
49	IOCL, Noonmati	2nd Phase	10
50	Central Mall	2nd Phase	10
51	Bhetapara Junction	2nd Phase	10
52	Park	2nd Phase	10
53	Dreamland Amusement Park	3rd Phase	10
54	Gauhati University	3rd Phase	10
55	Guwahati Airport	3rd Phase	10
56	Decathlon	3rd Phase	10
57	Basistha Temple	3rd Phase	10
58	Doul Govinda Mandir	3rd Phase	10
59	Saraighat Lake Side Park	3rd Phase	10
60	Tolaram Bafna Civil Hospital	3rd Phase	10
61	Saraighat War Memorial Park	3rd Phase	10
62	AEC	3rd Phase	10
63	Deepor Beel	3rd Phase	10
64	AIIMS	3rd Phase	10
65	IIT Guwahati	3rd Phase	10
<b>Total Cycle Infrastructure</b>			<b>700</b>

The identified proposed Public Bicycle Sharing spots and its routes are described in following map. The development of PBS network within the master plan area can be followed phase wise as mentioned in the map. Moreover, further development of the network within master plan area could be observed demand based after successful response to phase-1 and phase -2 PBS.

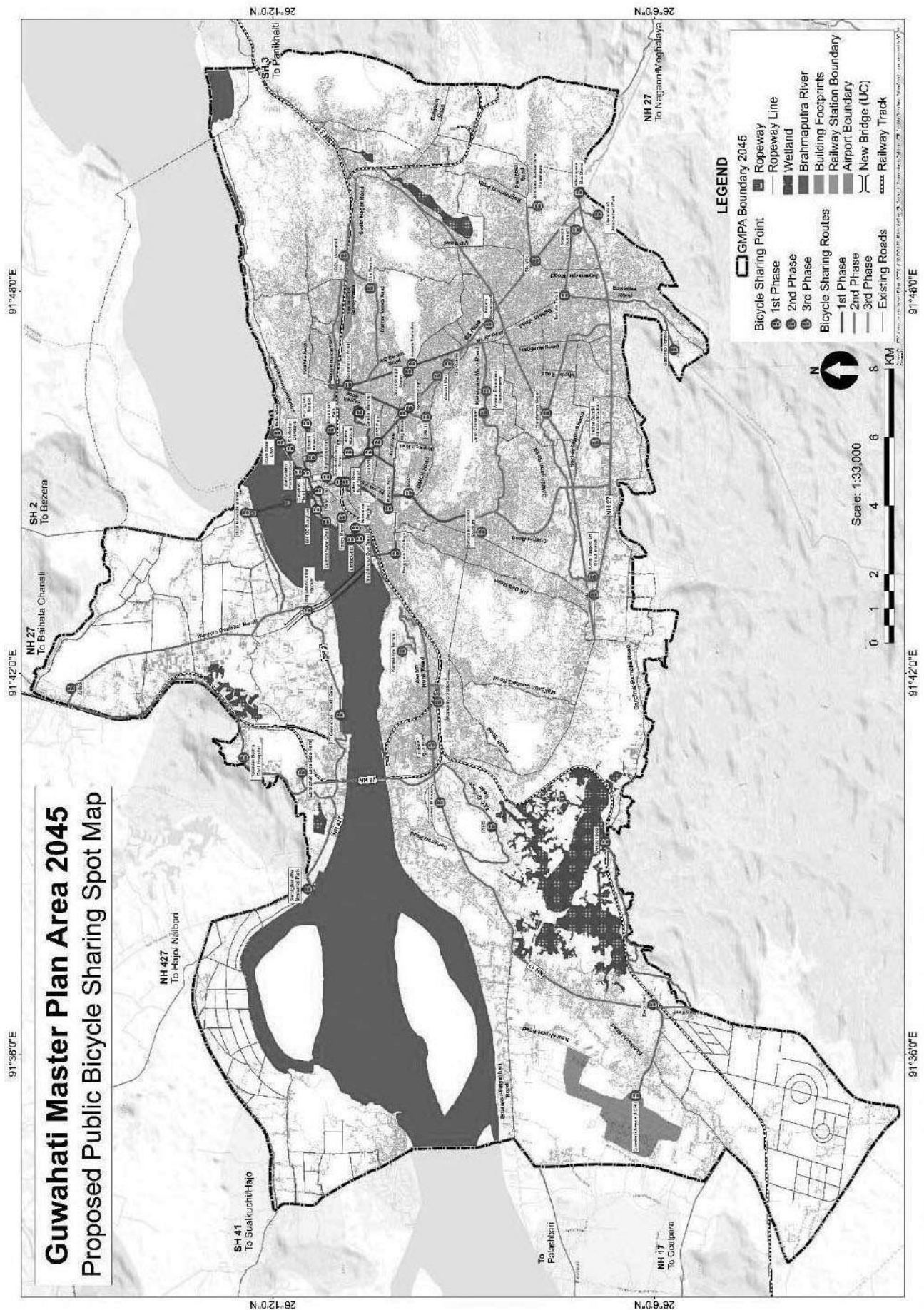


Figure 5-114 Proposed Public Bicycle Sharing locations and Routes

### 5.17.4 City Bus Modernization and Augmentation plan

Public transport bus services are generally based on regular operation of transit buses along a route calling at agreed bus stops according to a published public transport timetable. The existing city bus services is delapidated and hence requires upgradation with addition of fleet of buses and also upgradation of the Fuel technology.

The plan would aim and scrappage of all the buses more than 12 years and replace 50% of the fleet by electric and emission free buses. The same would be achieved in an incremental manner with addition of both CNG and Electric buses on yearly basis. Also, the new service would be provided using the GCC model. The demand of the buses and the fleet size on yearly basis are provided below.

Table 5-186 Forecasted bus demand and fleet sizes across city

Year/ type	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
<b>Maximum Passenger (BUS)</b>	13929	14364	14802	15241	15682	16122	16562	17002	17440	17876	18309	18739	19166
<b>Bus Fleet Size (Required)</b>	395	409	422	436	449	462	476	489	503	516	529	543	556
<b>Bus Fleet Size (MoHUA)</b>	810	840	870	900	930	961	991	1022	1052	1083	1113	1143	1173

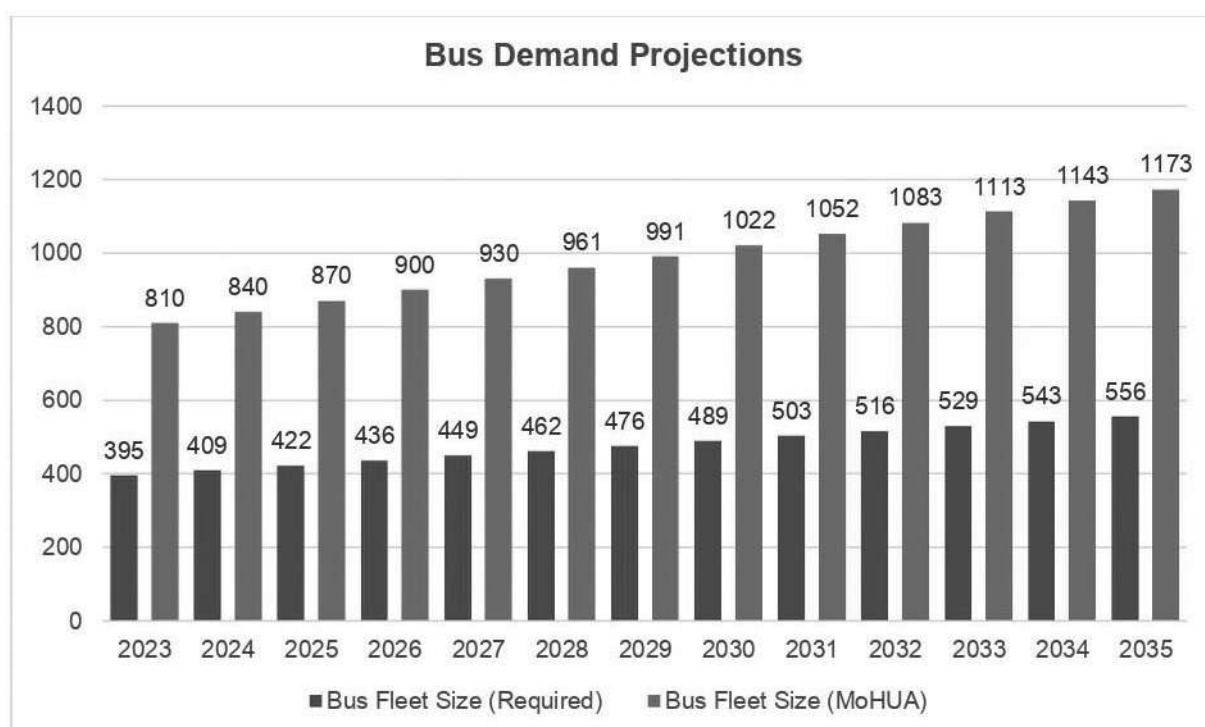


Figure 5-115 Bus Fleet size demand projection and comparison

Table 5-187 Fuel Categorised Bus requirement projections

Year/ Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Maximum Passenger (BUS)	13929	14364	14802	15241	15682	16122	16562	17002	17440	17876	18309	18739	19166
Bus Fleet Size (Required)	395	409	422	436	449	462	476	489	503	516	529	543	556
Bus Fleet Size (MoHUA)	810	840	870	900	930	961	991	1022	1052	1083	1113	1143	1173
Bus existing fleet size	150	150	150	150	150	150	150	150	0	0	0	0	0
Yearly extra Bus Required	245	13	13	13	13	14	11	14	164	14	13	14	19
Cumulative Buses	395	409	422	436	449	463	474	488	502	516	529	543	562
E-Bus Fleet Size (Required)	172	9	9	9	9	10	8	10	115	10	9	10	13
CNG Bus Fleet Size (Required)	74	4	4	4	4	4	3	4	49	4	4	4	6
Total E-bus	172	181	190	200	209	219	227	237	352	361	370	380	393
Total CNG Bus	224	228	232	236	240	244	247	251	151	155	159	163	169
Total Bus	395	409	422	436	449	463	474	488	502	516	529	543	562

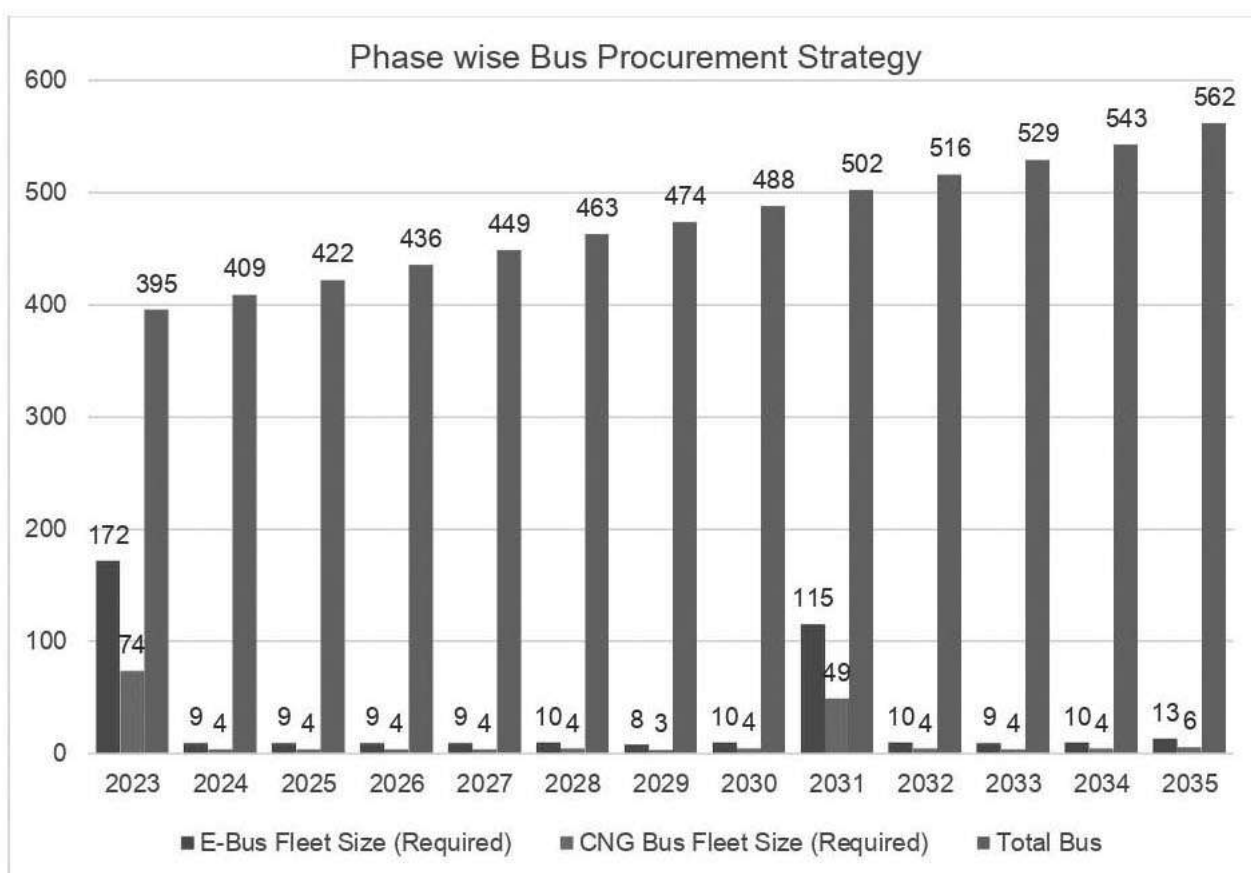


Figure 5-116 Fuel Categorised Bus Fleet size projections

The table and the bar chart illustrate the demand of the buses and the procurement plan of the electric buses. The demand and the procurement strategy are based on the existing trend of the public transport and the progressive scenario. The proportion of the electric buses would increase to nearly 40% from the initial period and thereafter with incremental increase the share of the electric bus would increase by 70% by the year 2031.

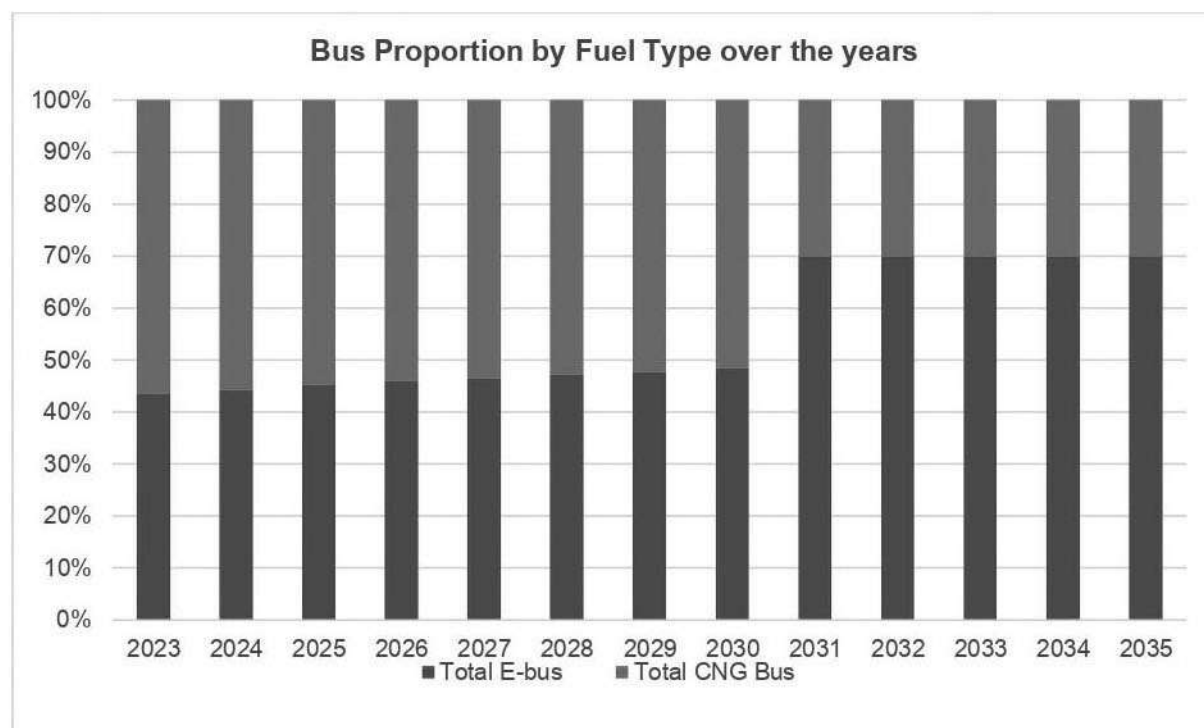


Figure 5-117 Forecasted Bus proportion by fuel type over the years

Table 5-188 Forecasted costing over the year by fuel type

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
E-Bus Fleet Size (Required)	172	9	9	9	9	10	8	10	115	10	9	10	13
CNG Bus Fleet Size (Required)	74	4	4	4	4	4	3	4	49	4	4	4	6
Total E-bus	172	181	190	200	209	219	227	237	352	361	370	380	393
Total CNG Bus	224	228	232	236	240	244	247	251	151	155	159	163	169
Cost of E-Bus (INR Cr.)	240.8	12.60	12.60	12.60	12.60	14.00	11.20	14.00	161.0	14.00	12.60	14.00	18.20
Cost of CNG Bus (INR Cr.)	33.30	1.80	1.80	1.80	1.80	1.80	1.35	1.80	22.05	1.80	1.80	1.80	2.70
Total Cost (INR Cr.)	274.1	14.40	14.40	14.40	14.40	15.80	12.55	15.80	183.05	15.80	14.40	15.80	20.90



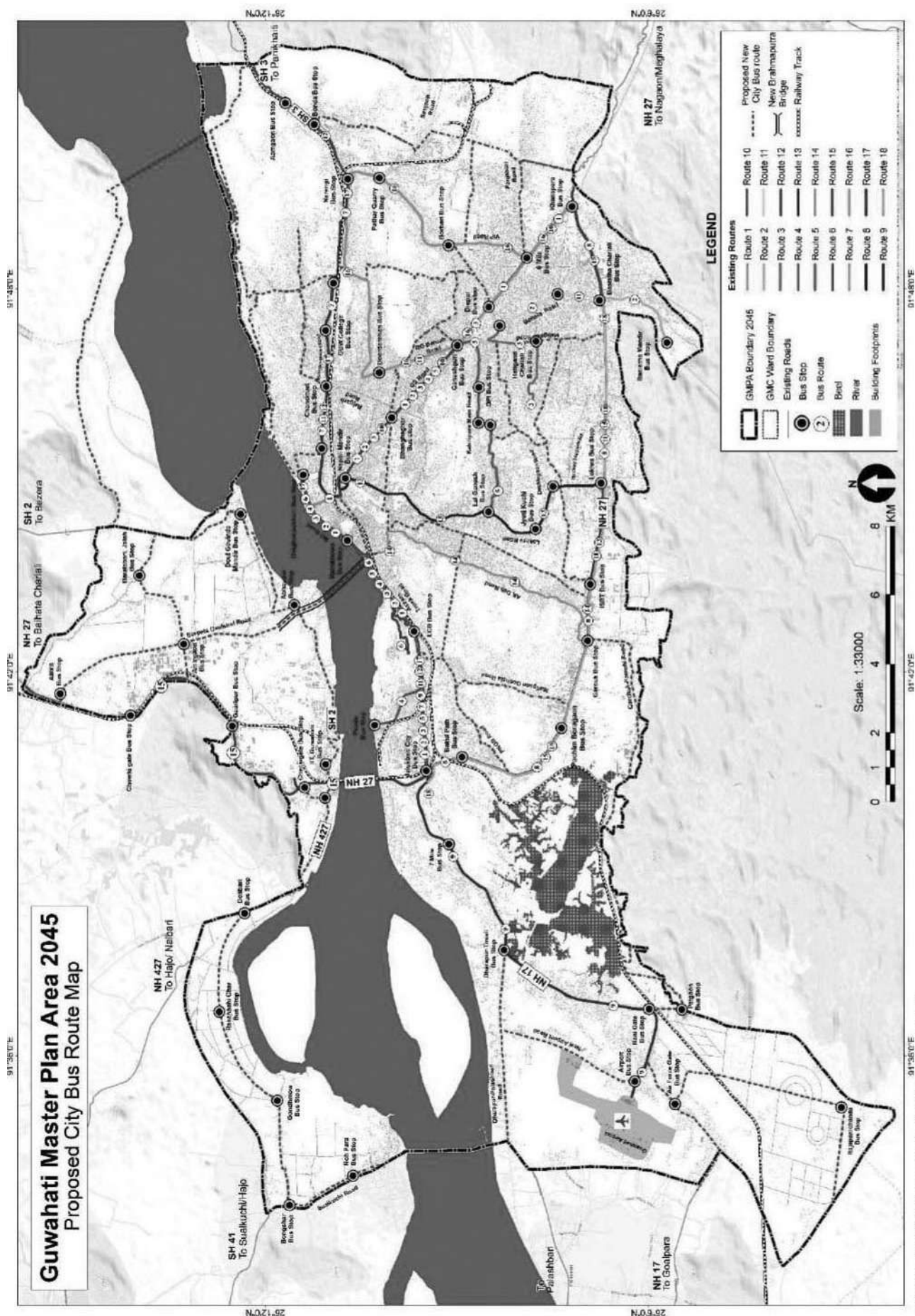
Transportation electrification is continuing to expand as more medium- and heavy-duty vehicles enter the market. Electric buses in particular — both transit and school buses — are hitting roads across the country as cities, schools, airports and other large organizations add them to their fleets. These buses provide a unique set of benefits to the organizations purchasing them, the communities they drive through, the environment around them and the electric utilities that power them.

Electric buses are highly efficient and have lower operating costs than diesel buses. Fuel savings can be significant when comparing electricity with diesel, and the buses also have fewer moving parts and maintenance needs. Between fuel and maintenance savings, they can save hundreds of thousands of dollars over their lifetimes that can be invested back into the operating organization or community.

Electric buses are safe, reliable and have similar rates of downtime to other technologies. Their quiet, smooth rides allow passengers to relax and easily have conversations, and the lack of a diesel engine reduces noise pollution.

In addition, both transit and school buses are often used in areas with high concentrations of people, and children are particularly susceptible to the negative effects of pollution, which has been linked to asthma and poor test performance in schools. Without vehicle emissions and particulates, electric buses provide cleaner air for our communities. They are even superior when considering the emissions associated with the electricity used for charging. In North Carolina, a diesel bus would need to average 14.7 mpg to achieve life-cycle emissions equal to that of an electric bus; actual mpg is closer to 4.8.

Considering the pros of e-Buses, new e-Bus routes have been identified which will replace the existing Metro Shared Taxi routes and will cater the city in maximum environment friendly way. Image represents proposed E-Bus and City bus routes I the city.



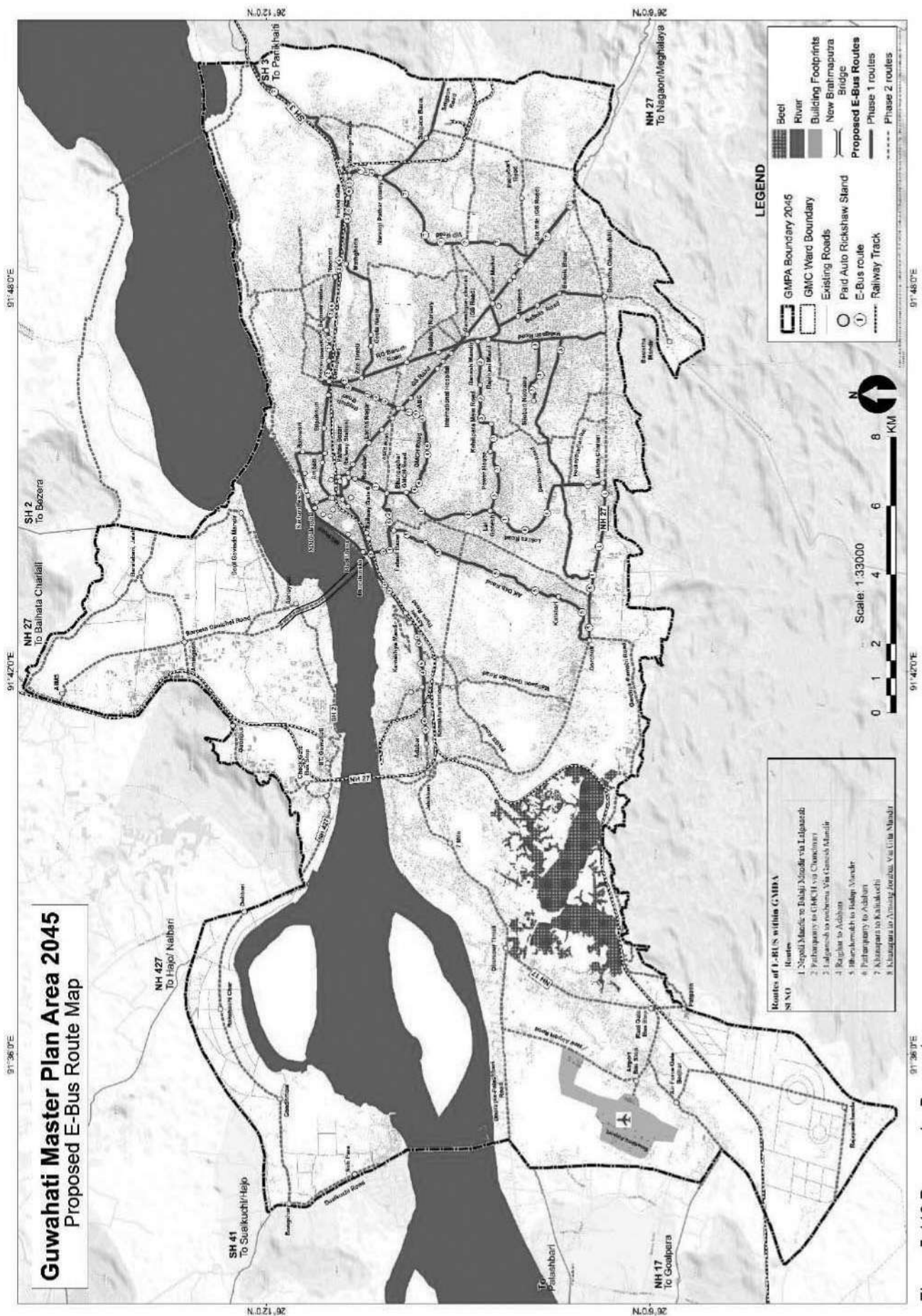


Figure 5-119 Proposed e-Bus route map



#### CASE STUDY: Virginia

Dominion Energy recognized the community advantages of electric buses and created a program to deploy school buses throughout Virginia. On the program's website, Dominion explains the benefits for students and communities, including inside air quality being six times better than non-electric models and greenhouse gas emission reductions of 54,000 pounds each year.

For the utilities that power electric buses, the technology can improve grid reliability and sustainability by helping to manage peak demand and supporting renewable energy integration. Many buses will run all day and charge in a garage at night, during off-peak times.



### 5.17.5 City wide Intelligent Transport Management System

Guwahati being a state capital and city of economic significance in the region, caters to different transport modes and the caters to most dense traffic in the region. Hence to reduce the stress of traffic management Intelligent Transportation Systems (ITS) is need of the hour. The Intelligent Transportation Systems (ITS) improve transportation safety and mobility and enhance productivity through the use of advanced communications technologies. ITS encompass a broad range of wireless and traditional communications-based information and electronic technologies.

When integrated into the transportation system's infrastructure and within vehicles themselves, these technologies relieve congestion, improve safety and enhance productivity. An intelligent transportation system is an advanced application that aims to provide innovative services relating to different modes of transport and traffic management which enable users to be better informed and make safer, more coordinated and 'smarter' use of transport networks.

Intelligent transport systems are an integral part of smart transportation initiatives and the wider smarter cities movement and have become an indispensable component of smart cities where mobility is a key concern for any city, whether this is going to school, college, the office or running daily errands and attending appointments.

An ITS can save citizens' time and contribute to making a city 'smarter'. An ITS enriches lives providing prior and up-to-date information about traffic, real-time running information, seating availability and more. All of which reduce travel time for commuters as well as enhancing safety and comfort. As well as reducing congestion, and ITS also improves road safety and efficient infrastructure usage.



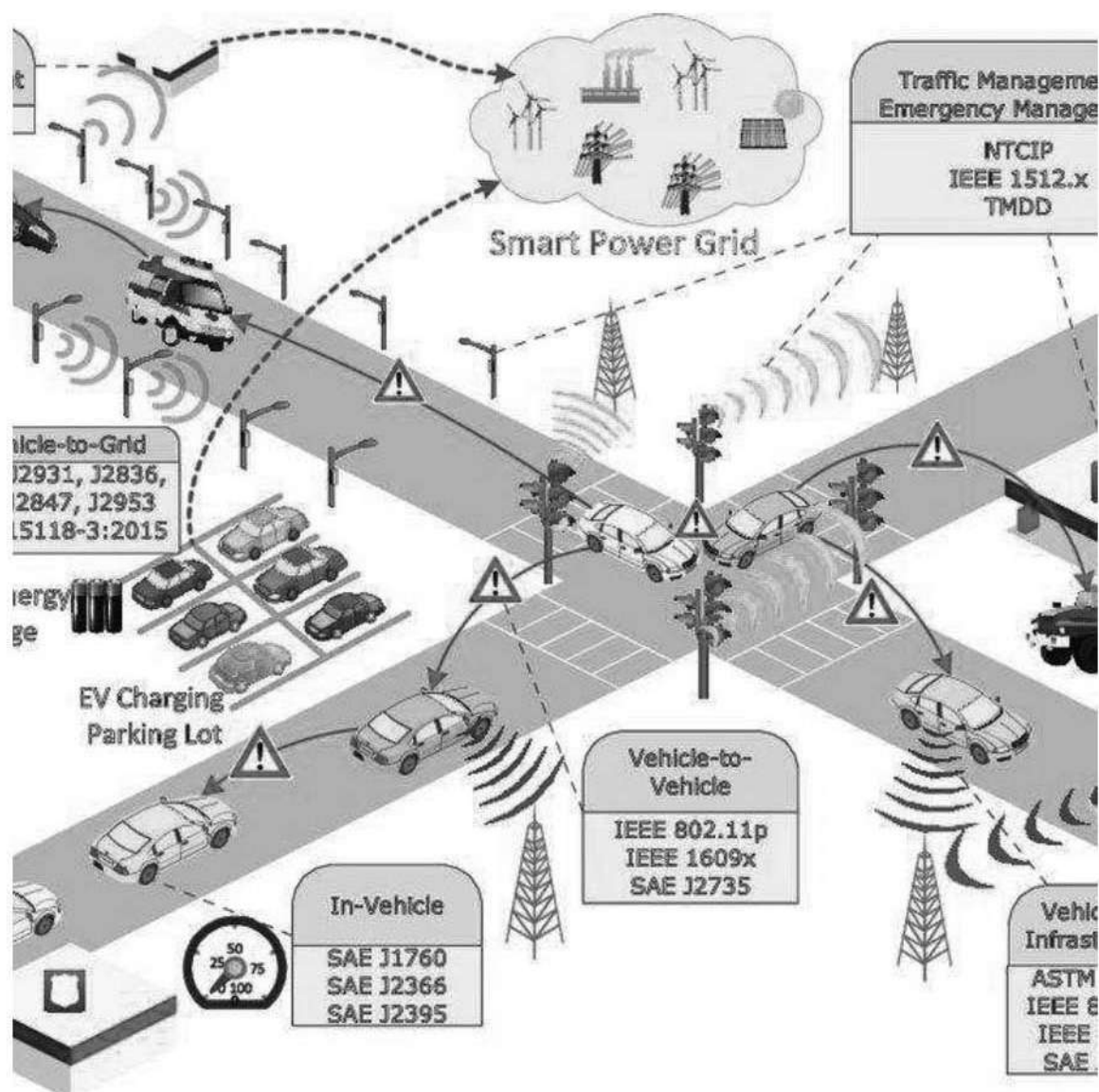


Figure 5-120 ITMS Conceptual representation

#### 5.17.5.1 Components of a Fully operational Intelligent Transport Management System

The fully operational ITMS system composes of Intelligent Infrastructure and Intelligent Vehicle. The sub components of each are listed below.

##### 5.17.5.1.1 Intelligent infrastructure

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| • Arterial Management            | • Information Management             |
| • Freeway Management             | • Crash Prevention and Safety        |
| • Transit Management             | • Roadway Operations and Maintenance |
| • Incident Management            | • Road Weather Management            |
| • Emergency Management           | • Commercial Vehicle Operations      |
| • Electronic Payment and Pricing | • Intermodal Freight                 |
| • Traveller Information          |                                      |



**5.17.5.1.2 Intelligent vehicles**

- Collision Avoidance Systems
- Driver Assistance Systems
- Collision Notification Systems

Together, these technologies comprise an intelligent transport system, helping to improve travel conditions and improve the overall 'liveability' of a city. The cost of a full fledged ITMS system with the above mentioned components would be around INR 250 Crore. The cost may increase or decrease with variation to the requirements a specification.

**5.17.6 Transport Nagar and Logistic Hub**

The Guwahati being the gateway city handles million tons of truck load on monthly basis. Due to the lack of proper transport and logistic arrangement some of the truck load results in economic loss to the region. So, to have an organized handling of the truck load and the urban freight a metropolitan level multi-modal Logistic park is being proposed at Jalah on NH 27 and adjoining to Agthori railway station. The aim of the logistic hub is to cater to the existing daily truck load into the city limit and through the city limits. This multimodal logistic park could also be utilized for inland container warehouse and transfer station. A feasibility and detailed project report for the same can be taken up by next five years. The proposed location of MMLP is represented in fig. 5-121 below.



Figure 5-121 Proposed Multimodal Logistic Park location within GMPA 2045i

The proposed location of MMLP will be benefited by both road and rail for its cargo terminal as well as logistic facility center. A logistics hub is an entire region with its working space, transport maintenance depots, bays, custom clearance points, packing departments, parking, office space, etc. The infrastructure of the parks may vary after the detailed project report. The logistics hub would house warehouses, where companies can perform the full range of operations to process freights. The logistics hub can be designed to process more than 1 million TEU (the twenty-foot equivalent unit that is used to describe a container's capacity). The area of a logistics hub could be around 1 million square meters.

**CASE STUDY : Odesa Logistic centre**

Despite logistics hubs beginning to develop in Ukraine, there are already some examples in the market. “The Dry Port” in Odesa is one of them. In 2005, Euro terminal was supported by the European Bank for Reconstruction and Development and constructed the logistics center. “The Dry Port” covers an area of 42 hectares (420.000 square meters). “The Dry Port” helps companies to deliver freights by ground and sea. There are warehouses to store containers, TIR-parking, temporary storage facilities, LCL cargo handling complex in the territory. The Port of Odesa is near. So, “The Dry Port” is a solution to conduct the full range of logistics operations and deliver freights to the Port of Odesa faster. Moreover, goods transport doesn’t go through the city’s highways. Also, in February 2021, Smart Holding announced that it plans to build a logistics hub in Mykolaiv. The facility will be located in the former shipyard area. This shows that Ukrainian companies have a need in complex logistics solutions.



### 5.17.7 Decongestion of Core City

It could be inferred from the geometrical study of the core city area and the development of arterial and sub arterial roads in the city, that the reason of congestion in the city is less number of radial roads connecting major arterials and sub-arterials of the city. The more there will be the radial roads the more distribution of traffic will take place.

To decongest the core city area some of the major transforms have been discussed and agreed to implement in the city. Development of ring roads within and around planning area is one of the major transforms to be given priority.

#### 5.17.7.1 Development of Ring Roads

Ring roads will be developed in Four tier, 1. Central Core Ring Road, 2. Inner Ring Road, 3. Intermediate Ring Road and 4. Outer Ring Road. Except outer ring road rest of three ring roads fall within the planning area. The alignment and connectivity of ring roads are as mentioned in below figure 5-122.

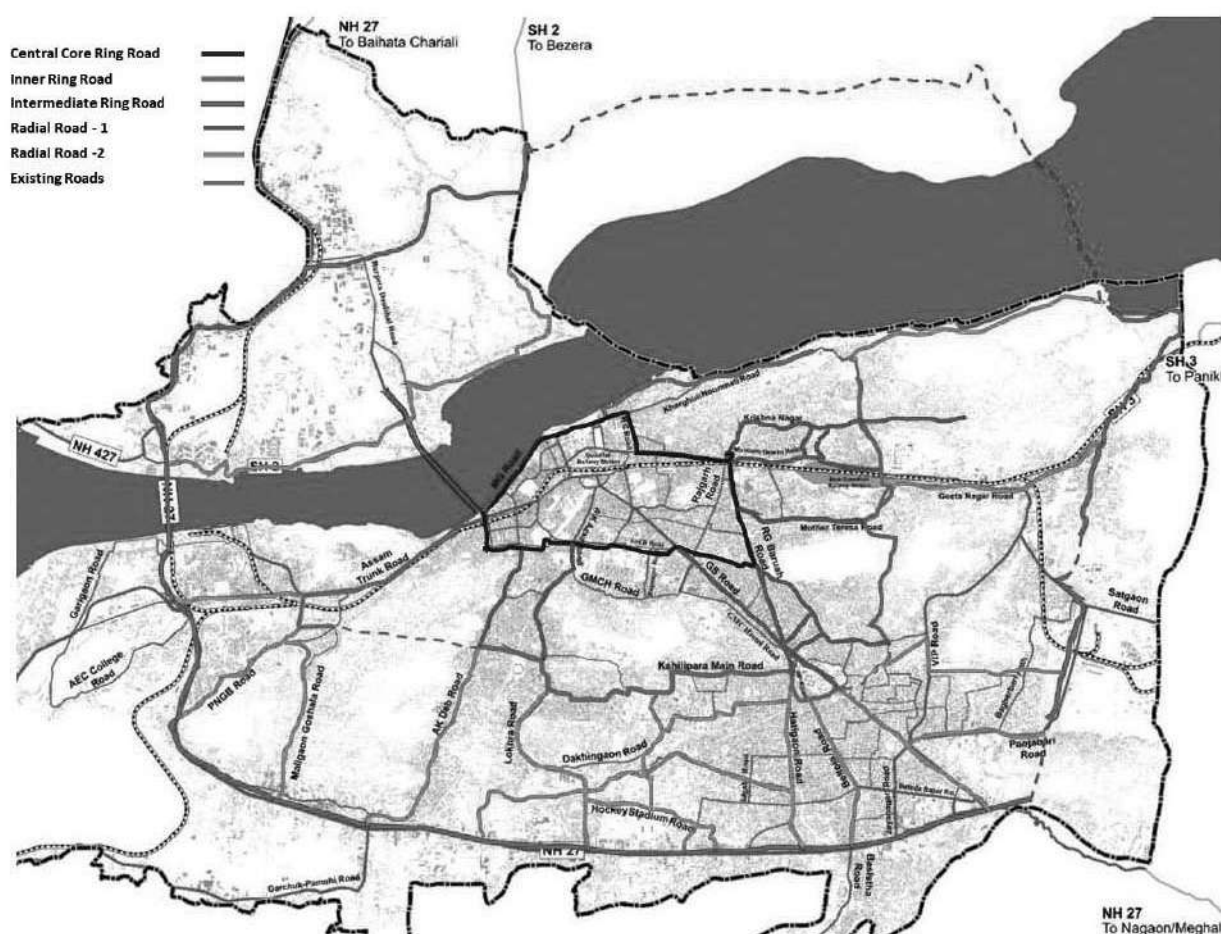


Figure 5-122 Proposed ring roads in and around Guwahati planning area

**Central Core Ring Road:** The inner most Central core ring road connects all major arterial roads of the city and generates central loop around core CBD area of Guwahati. The roads which are connected by Central core ring road are, MG road, AT Road, AK Deb Road, Lokhra Road, GS Road, RGB Road, MD Road and Kharguli-Noonmati road. The Central core ring road has been proposed for 24mt widening for better carrying capacity of central traffic.

**Inner Ring Road:** The inner ring road further connects major arterial and sub-arterial roads of the city and generates inner loop around core city area of Guwahati. The roads which are connected by inner ring road are, PNGB Road, AT Road, MG Road, Refinery Road, AK Deb Road, Lokhra Road, Kahilipara main road, Secretariate road, Khagen Mahanta Road, Geeta nagar road, GS Road, RGB Road and MD Road. The inner ring road has been proposed for 24mt of widening by linking the roads Secretariate road and Mahapurush Madhabdeb path for better serviceability.

**Intermediate Ring Road:** The intermediate ring road further extends outwards and connects north Guwahati to south Guwahati by NH 27 as a major arterial road via new link roads connecting Panjabari road, Geetanagar road, SH 3, SH 2 via additional bridge on Brahmaputra to NH 27 on north. The intermediate ring road has been proposed for 60mt of widening for serving the purpose of through traffic majorly of HMV without entering the core city Guwahati.

#### 5.17.7.1.1 Widening and acquisition of roads

Table 5-189 Road wise widening and acquisition for Proposed ring roads

Sl. No.	Road Section	Length (km)	Existing ROW (m)	Proposed ROW(m)	Proposed Configuration
<b>Core Central Ring Road</b>					
1	ASEB Road	2.32	12	24	4 lanes divided (Widening required)
2	NS Road	1.88	12	24	4 lanes divided (Widening required)
3	Bharalu Riverbank Road	1.5	-	24	4 lanes divided (Land acquired)
4	MG Road	3.14	24-16	24	4 lanes divided (Widening required)
5	Bhuban Road	0.7	12	24	4 lanes divided (Widening required)
6	MC Road	0.83	12	24	4 lanes divided (Widening required)
7	MD Road	2.5	24	-	-
8	RGB Road	1.83	24	-	-
<b>Total</b>		<b>14.72</b>			

<b>Inner Ring Road</b>					
1	AT Road	3.84	24	-	-
2	MG Road	2.85	16	24	4 lanes divided (Widening required)
3	Refinery Road	8.02	9	24	4 lanes divided (Widening required)
4	Mother Teresa road	0.5	24	-	-
5	Amayapru Road	3.0	6	24	4 lanes divided (Widening required)
6	Dr. Zakir Hussain path	0.58	8	24	4 lanes divided (Widening required)
7	New link Road 1	1.0	-	24	4 lanes divided (Land to be acquired)
8	Secretariate road	1.42	18	24	4 lanes divided (Widening required)
9	Kahilipara Main Road	5.1	15	24	4 lanes divided (Widening required)
10	Lokhra road	0.63	18	24	4 lanes divided (Widening required)
11	Itabhata Road	1.20	12	24	4 lanes divided (Widening required)
12	New Link Road 2	2.52	-	24	4 lanes divided (Land to be acquired)
13	Railway Coloni Road	1.27	8	24	4 lanes divided (Widening required)
<b>Total</b>		<b>31.93</b>			
<b>Intermediate Ring Road</b>					
1	NH 27 (Khanapara to Jalukbari)	9.89	60	-	6 lanes divided
2	NH 27 (Jalukbari to Rangia)	18.6	24	60	6 lanes divided (Land to be acquired)
3	Bhetamukh road	4.68	12	60	6 lanes divided (Land to be acquired)
4	SH 2	1.32	14	60	6 lanes divided (Land to be acquired)
5	Dirgheshwari Temple road	4.90	15	60	6 lanes divided (Land to be acquired)
6	Kurua-Khatara road	5.21	6	60	6 lanes divided (Land to be acquired)
7	New Bridge	3.8	-	60	6 lanes divided
8	Titukura road	1.66	6	60	6 lanes divided (Land to be acquired)
9	SH 3	2.63	20	60	6 lanes divided (Land to be acquired)
10	New link road 1	3.0	-	60	6 lanes divided (Land to be acquired)
11	Panjabari road	3.34	12	60	6 lanes divided (Land to be acquired)
12	New Link Road 2	1.58	-	60	6 lanes divided (Land to be acquired)
<b>Total</b>		<b>60.52</b>			

(Source: Consultant compilation)



### 5.17.7.2 Grade Separation Proposals

Grade separation is the separation of the levels at which roads cross one another to prevent conflicting rows of traffic or the possibility of accidents. Here, many existing arterial or sub-arterial roads are proposed for road widening which will generate high volume intersections with low hierarchical road. To avoid conflict and uninterrupted traffic movement many intersections are proposed under grade separation. The proposed location of grade separators are depicted in figure 5-123 below.

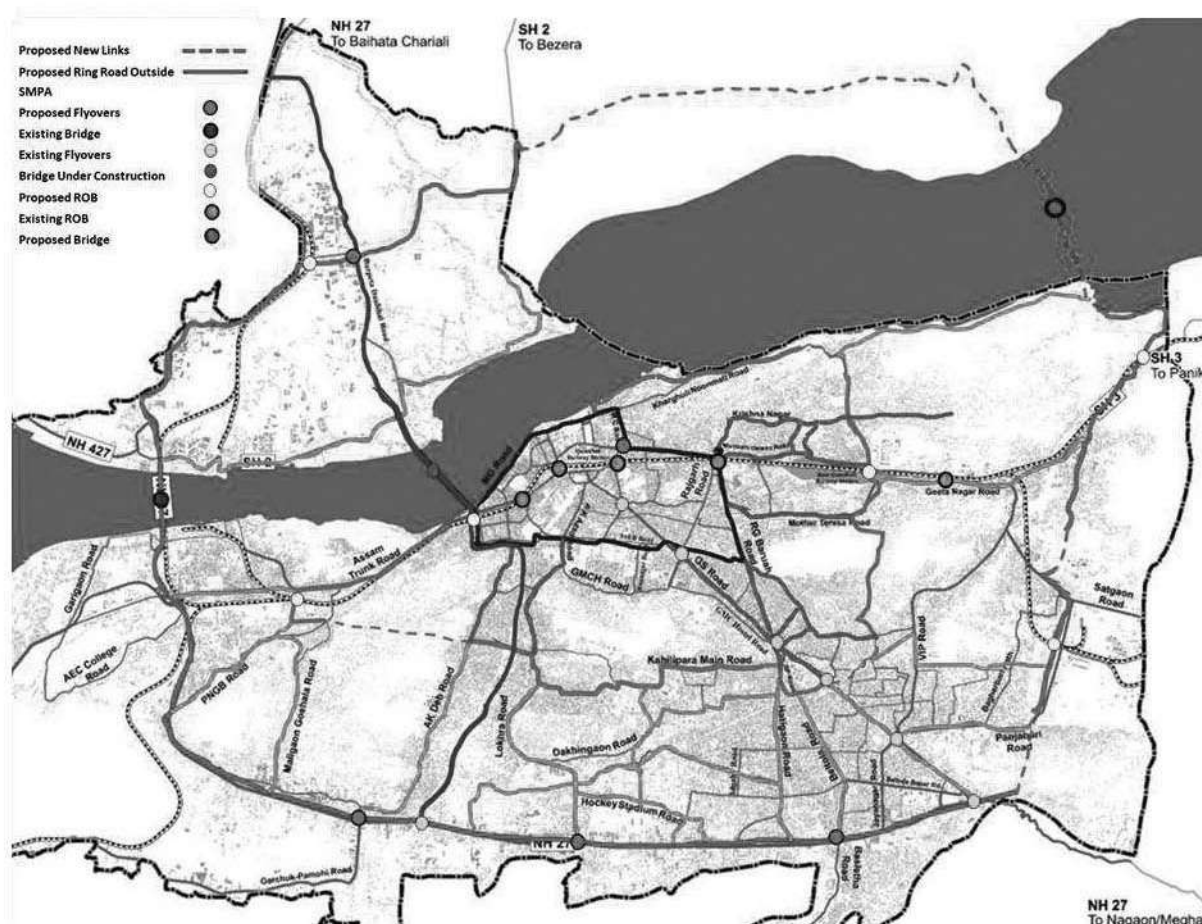


Figure 5-123 Proposed grade separators and bridge location map

#### 5.17.7.2.1 Proposed Flyovers

Multiple locations are identified to remove the bottlenecks from the existing transportation scenario and to improve the mobility in city. The identified proposed flyover locations are as mentioned below.

1. Basistha Intersection (NH-27 – Beltola road)
2. Lokhra Intersection (NH-27 – Lokhra road)
3. Garchuk Intersection (NH-27 – AK Deb Road)
4. Guwahati Club Intersection (DR. B Baruah- GNB Road)
5. Ring Road Intersection (Barpeta Daulshal road – Gauripur Rangmahal Road)

Fig.5-123 describes the locations of proposed flyovers within planning area.

**5.17.7.2.2 Proposed ROB (Road Over Bridge)**

The Road Over Bridge (ROB) are constructed where Road alignment crosses above the Railway alignment. ROB are usually constructed where enough space is available for the approaches. The requirement of vertical clearance for Railway is more than Road section. Thus the more approach length is required in case of ROB. The identified proposed flyover locations are as mentioned below.

1. New Railway Station (connecting Refinery – Mother Teresa Road)
2. Narengi Railway line (connecting Tintukura – SH 3 Road)
3. Mora Bharalu Culvert (connecting Bharalu canal road – Brahmaputra Bridge)
4. Kamakhya Station (connecting PNGB road – AT Road)
5. Agthori railway line (connecting NH-27 – Gauripur Rangmahal road)
6. Azara Railway line (connecting Jogipara- Jabey road)

Fig.5-123 describes the locations of proposed ROB within planning area.

**5.17.7.2.3 Proposed RUB (Road Under Bridge)**

The Road Under Bridge (RUB) are constructed where Road alignment crosses above the Railway alignment. RUBs are usually constructed based on Train Vernacular Unit (TVU) study. If the TUV of particular crossing is more than 1 lakh units, then that particular crossing requires either a road over bridge or road under bridge. The identified proposed RUB locations are as mentioned below.

1. Azara Railway Station (connecting NH-17 – Rani Road)

**5.17.7.3 Proposed River Bridge**

One additional bridge over Brahmaputra River is proposed connecting north Guwahati to South Guwahati. As part of completing the 60mt arterial road circular loop for intermediate ring road and to decongest the core city traffic by diverting HMV movements in outer periphery, the proposal of bridge is given as per transportation study. The possibility of construction of bridge from North Guwahati Kurua Road to South Guwahati Tintukura Road may be explored.

### 5.17.8 Road Hierarchy

It is important to devise a street classification which is in consideration with the proposed land use. The roads are classified into the following 3 categories according to their function and activities that take place along the road.

Table 5-190 Road category proposed for Guwahati planning area

Sr. no	Category	Characteristics	ROW
1.	Arterial	<ul style="list-style-type: none"> <li>City to City linking</li> <li>Largest volumes of traffic</li> <li>Commercial/Mixed residential uses are predominant along the road</li> </ul>	60 m
2.	Sub-Arterial	Mixed residential Use along the road <ul style="list-style-type: none"> <li>Feeding traffic to arterial roads</li> </ul>	45 m
3.	Collector	Connecting residential areas with sub arterial roads/arterial roads	30m & 24 m
4.	Distributor Roads	Distributes traffic and bus services within the main residential, commercial and industrial built-up areas.	18 m & 15 m

### 5.17.9 Complete Street design

Complete Streets are streets for all users and all modes such as Public Transport, Bi-Cyclist, Pedestrians, Private cars etc. within an urban area. They are designed and operated to prioritize safety, comfort, and access to destinations for all people who use the street, especially people who have experienced systemic underinvestment or whose needs have not been met through a traditional transportation approach, including older adults, people living with disabilities, people who cannot afford or do not have access to a car. Complete Streets make it easy to cross the street, walk to shops, jobs, and schools, bicycle to work, and move actively with assistive devices.

They allow buses to run on time and make it safe for people to walk or move actively to and from train stations.

Creating Complete Streets means transportation



agencies must change their approach to community roads. By adopting a Complete Streets policy, communities direct their transportation planners and engineers

to routinely design and operate the entire right of way to prioritize safer slower speeds for all people who use the road, over high speeds for motor vehicles. This means that every transportation project will make the street network better and safer for people walking, biking, driving, riding transit, and moving actively with assistive devices—making your town a better place to live.

#### 5.17.9.1 Arterial Road Street

The most utilized arterial road in planning area is NH-27 by HMVs, LMVs and two-three wheelers by the commuters and migrants to Guwahati. Considering the potential of NH-27 it is considered to be developed as Janpath of the city. The facilities will be provided being a Janpath will be PBS sharing scheme, active streets, paid on street parking, city surveillance cameras, automated solar street lights, emergency vehicle notification, coordinated traffic signaling, shared lane bicycle markings, stringent enforcement, bioswales and underground services.

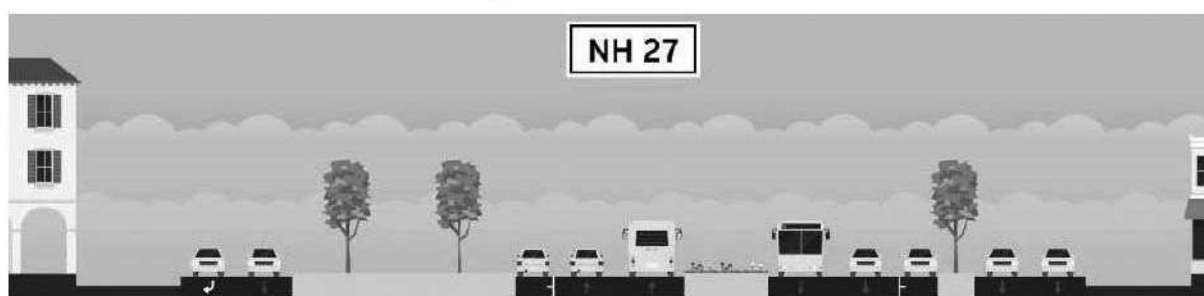


Figure 5-125 Existing 50m NH 27 Arterial road cross section

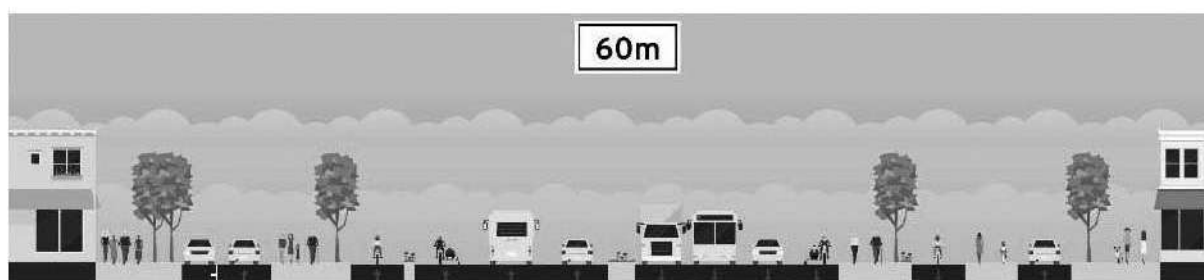
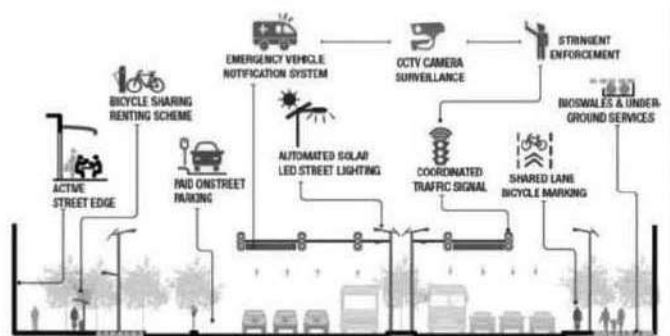


Figure 5-124 Proposed 60m Arterial Road cross section

A typical cross section of an arterial road is given in the figure above. It shall have carriageways, median, Multi-Functional Zones (MFZ), service lanes and footpaths.

Multi-functional zone is a zone to accommodate street components such as tree planting, auto rickshaw stand, hawkers zone, bus stop, traffic police booth, fire hydrants, street lights etc. as per the requirement. The RoW of the arterial road is 60m.



### 5.17.9.2 Sub-Arterial Road Street

Sub-arterial roads shall have carriage ways, bicycle track, parking lane, waiting area, median, service lanes, Multi-Functional Zones and sidewalks as shown in the figure 5-125. As mentioned earlier, the RoW of the sub-arterial road is 45m.

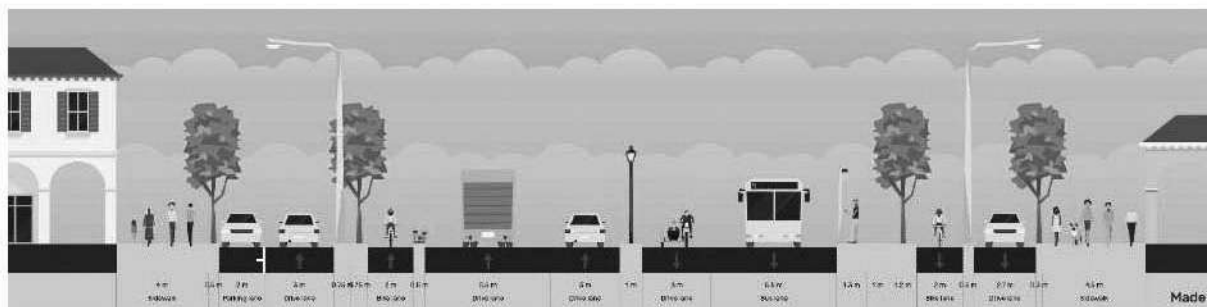


Figure 5-126 Proposed 45m Sub-arterial road

### 5.17.9.3 Collector Road Street

Collector roads shall have carriage ways, waiting area, median, Multi-Functional Zones, bicycle track, parking lane and sidewalks as shown in the figure 5-126. As mentioned earlier, the width of the collector road is either 30m or 24m.

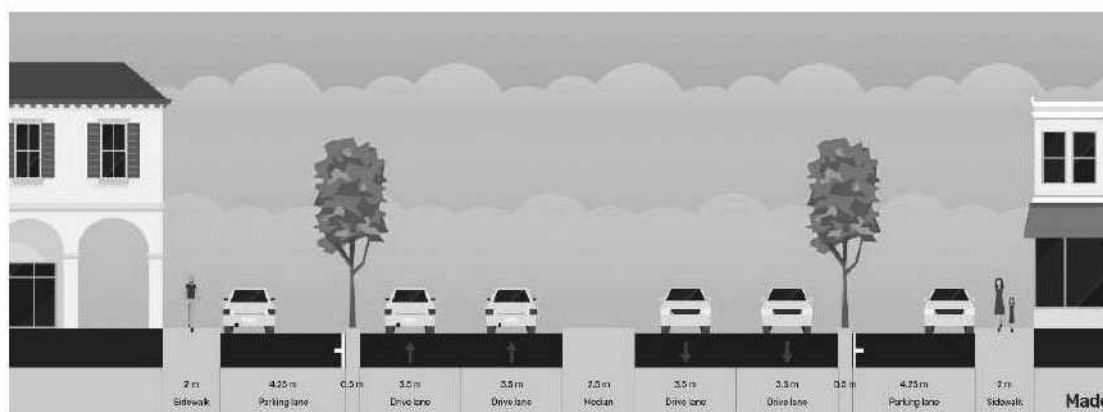


Figure 5-128 Existing 30m Collector road street

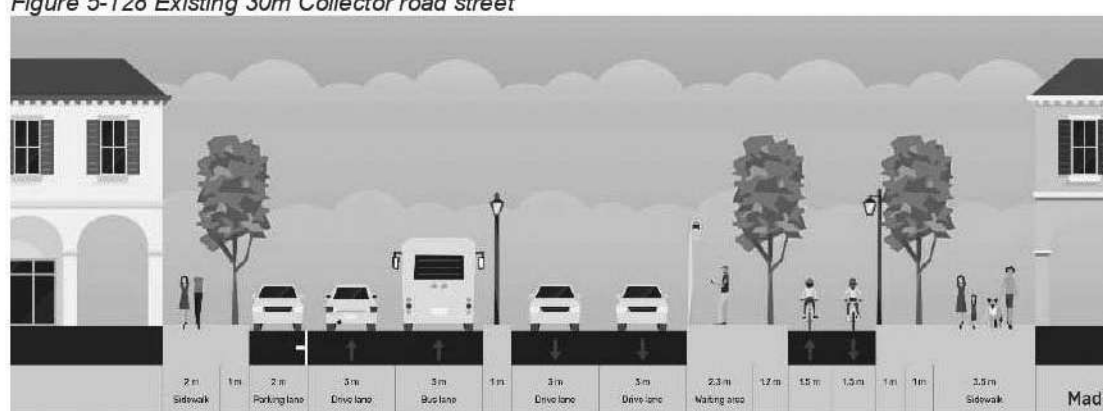


Figure 5-127 Proposed 30m Collector road street



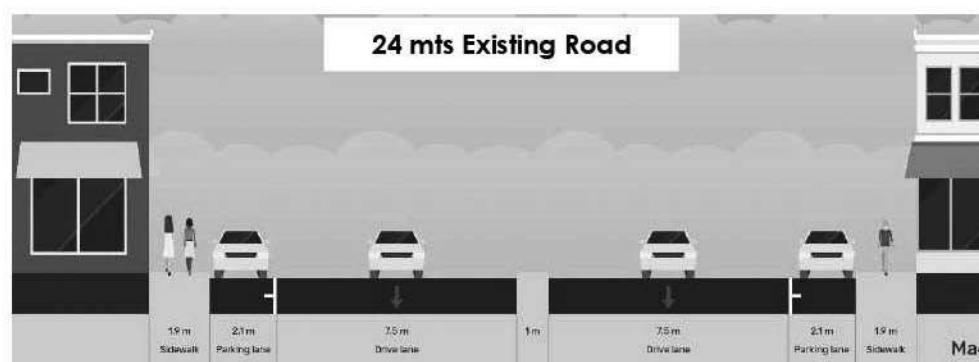


Figure 5-130 Existing 24mt collector road street



Figure 5-129 Proposed 24mt collector road street

#### 5.17.9.4 Distributor Road Street

Distributor roads shall have carriage ways, sidewalk, Multi-Functional Zones and bicycle track as shown in the figure 5-130. As mentioned earlier, the width of the collector road is either 18mt or 15 mt.

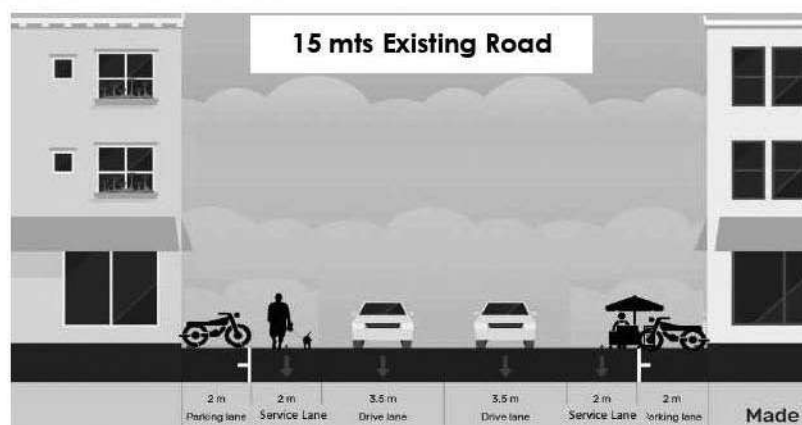


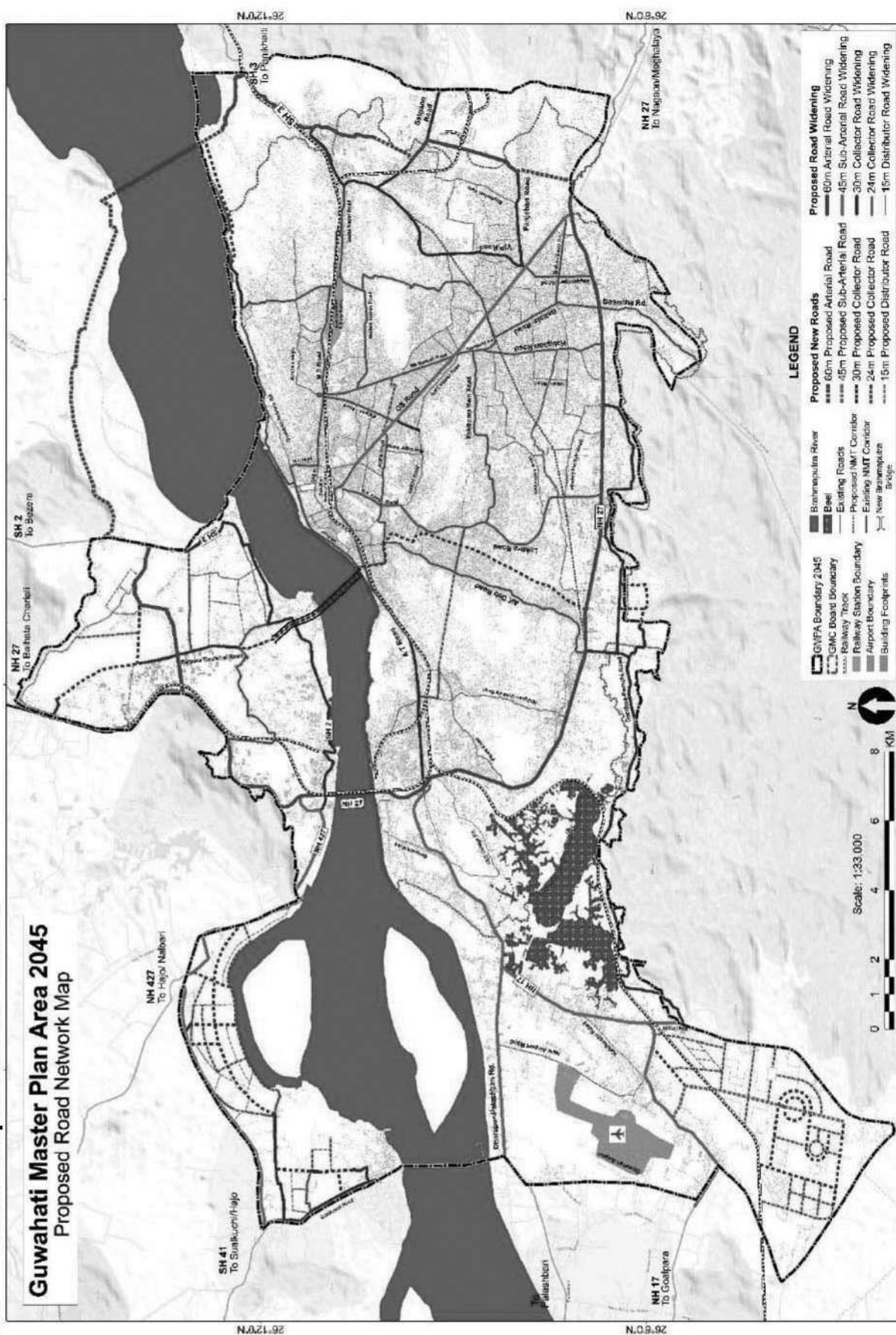
Figure 5-132 Existing distributor road street



Figure 5-131 Proposed Distributor road street



### 5.17.10 Road Proposals for GMPA



**5.17.10.1 Proposed Road widening on NH**

Sl no.	Name & route of the road (NH)	Type of road	Length of the Road (km)	Existing ROW (m)	Proposed ROW (m)
1.	Bongara to Kahikuchi	NH 17	2.50	12	45
2.	Rani to Kalitakuch (VIP Airport Road)	NH 17	1.00	40	45
3.	Jalukbari to Rani	NH 17 (Bypass)	11.50	28	45
4.	Jalukbari to Lankeshwar	NH 17	2.00	15	45
5.	Amingaon to Hajo	NH 427	8.00	20	45
6.	Amingaon towards Rangia	NH 27	11.50	24	60
7.	Saraighat Bridge	NH 27	1.39	18	45
8.	Jalukbari To Saraighat Bridge	NH 27	1.50	40	60
9.	Khanapara to Jalukbari	NH 27	17.50	60	60

**5.17.10.2 Proposed Road widening on SH**

Sr. No.	Name of the road (SH)	Type of road	Length of the Road (km)	Existing ROW (m)	Proposed ROW (m)
1.	Amingaon towards Bezera	SH 2	14.20	18	30
2.	Narengi to TinTukura Road	SH 3	4.50	25	60
3.	Dadara hajo to Amingaon	SH 41	6	12	45

**5.17.10.3 Proposed Road widening on Collector and Distributor road**

Sl no.	Name of the Roads	Route	Length of Road (km)	Existing ROW (m)	Proposed ROW (m)
1	G S Road	Khanapara to Paltan Bazar Bus Stop	9.70	30	45
		Paltan Bazar Bus Stop to Paltan Bazar Police Station	0.23	22	24
2	A. T. Road	Paltanbazar Police Station to Bharalumukh Traffic Signal	2.23	20	24
		Bharalumukh Traffic Signal to Maligaon	1.29	20	24
		Maligaon to Jalukbari Flyover	2.30	30	30
3	R G B Road	Ganeshguri to Chandmari Flyover	4.33	24	24
4	V I P Road	Sixmile Flyover to Narengi Tiniali	6.28	30	30
5	Dr. B Barooah Road	Ulubari Flyover to Guwahati Club	1.16	12	15

6	<b>GMCH Road</b>	Ganeshguri to GMC Auditorium	2.39	10	15
		Rupnagar L P School to Birubari Tiniali Chowk	2.40	12	15
		Bhangaghar Flyover to Rupnagar L P School	0.65	30	30
7	<b>Beltola Bazaar Road</b>	Khanapara Vetenary to Beltola tiniali	2.25	24	24
8	<b>Lokhra Road</b>	Kalapahar to Birubari Tiniali	2.15	18	24
		Lokhra Chariali to kalapahar	3.83	20	24
9	<b>Dr. B K Kakati Road</b>	Ulubari Flyover to ASEB Road	0.81	15	15
		ASEB Road to Sarabhathi Chowk	0.75	12	15
10	<b>Maniram Dewan Road</b>	Noonmati Flyover to Guwahati Refinery Mural	1.67	20	24
		Guwahati Refinery Mural to Chandmari Flyover	2.91	15	24
		Chandmari Flyover to Guwahati Club	1.81	18	24
11	<b>A K Dev Road</b>	Garchuk Charali to Kumarpar	7.24	15	24
12	<b>A K Azad Road</b>	Birubari Tiniali to Nepali Mandir	7.24	18	24
13	<b>M G Road</b>	Bharalumukh Traffic Signal to Sukreshwar Devalay	1.97	24	24
		Sukreshwar Devalay to Guwahati Planetarium	1.05	16	24
14	<b>A S E B Road</b>	Dr. B K Kakati Road to ABC	1.20	12	24

#### 5.17.10.4 Proposed Roads (New / Missing Linkages)

Sr. No.	Name of the road (SH)	Length of the Road (km)	Existing ROW (m)	Proposed ROW (m)
1.	Road starting from GS road parallel to Bharalu river up to RGB Road	1.5	6	24
2.	Road from Secretariate Supermarket flyover to by lane no. 9 road	1	20	24
3.	Road from Taltala main road to Satgaon main road at Noonmati Cantonment	1.2	-	60
4.	Tunnel road from Panjabari road to NH-27	2	-	60
5.	Tunnel road from ACA stadium road to Railway colony	2.5	-	24
6.	Elevated canal road	7.6	-	30

### **5.17.11 Intersection Redesign**

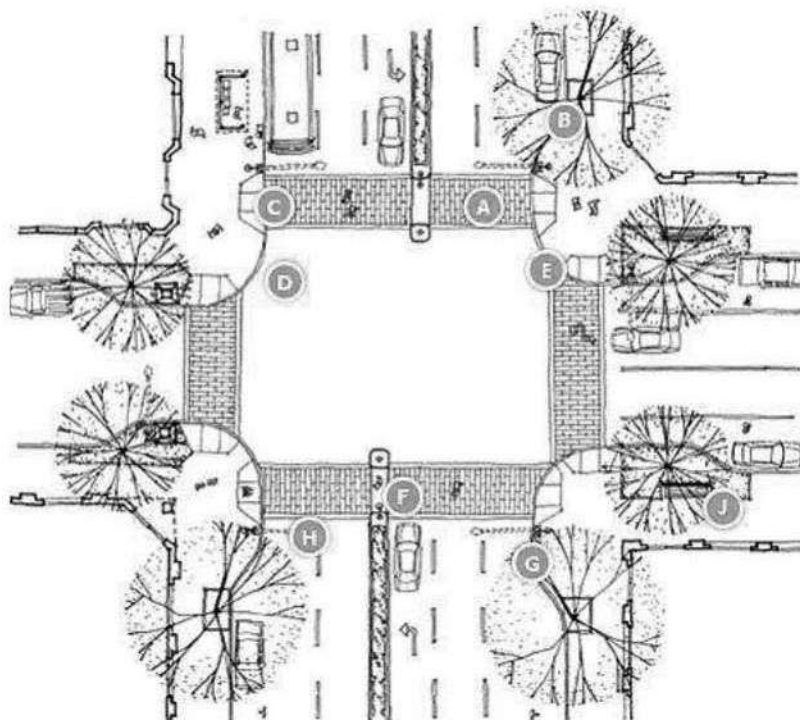
To promote non-motorized transport and to promote safety and smoother movement of all the modes of transport redesign of the intersection and signalization using scientific method is suggested for all the major intersections. The redesign of the intersection be taken with the priority to pedestrians and bi-cyclists.

In addition to increasing capacity and reducing costs, all non-traditional intersections are thought to be substantially safer than traditional designs, due to the reduction of the number of conflict points. Conflict points have always served as a surrogate for safety (with the least number of conflict points being the safest). Traditional intersection forms typically have 32 conflict points, while most non-traditional forms have 16. Likewise, a traditional diamond interchange has 30 conflict points, while most non-traditional interchange forms have only 16.

Also, Intersections should be designed to promote pedestrian safety and comfort. The aim of the intersection design be:

- encourage people to walk by creating a safe and inviting pedestrian realm;
- minimize pedestrian crossing distance, time and exposure to potential conflicts;
- maximize pedestrian visibility while providing design treatments that slow vehicles;
- slow traffic to allow drivers more reaction time and decrease severity when collisions do occur; and
- appropriately reflect the street and transportation context.

With due consideration to the IS to the Specific features of pedestrian-friendly intersections include:



- **A. Visible crosswalks:** Well-marked, visible crossings should be provided to alert drivers to the fact that they are approaching a location where they may encounter crossing pedestrians. In some cases, raised or colored crossings may be appropriate.
- **B. Parking Restrictions at corners:** Restricting parking adjacent to corners makes pedestrians and vehicles approaching intersections more visible to one another.
- **C. Crossing aids:** Accessible pedestrian facilities such as curb ramps and accessible pedestrian signals should be provided.
- **D. Tight curb radii** Curb radii for turning vehicles should be minimized to shorten crossing distances, increase pedestrian visibility, and slow turning traffic.
- **E. Curb extensions:** The installation of curb extensions should be considered in areas with high pedestrian volumes to reduce crossing times, increase pedestrian visibility, and slow turning traffic.
- **F. Median refuges:** Where medians are present or space otherwise exists, median refuges should be provided up to the crosswalk to provide a space for crossing pedestrians who may not be able to cross the entire roadway before the end of the walk phase.
- **G. Roadway and pedestrian lighting:** Intersections should be well-lit at night to improve visibility for all users. Sufficient lighting to illuminate crossing pedestrians should be provided.

- **H. Streetscape elements:** Streetscape elements, including trees, plantings, and seating should be provided adjacent to intersections to enhance the character and quality of the public realm and the sense of an intersection as an important public space.
- **J. Traffic calming features:** Intersections may contain traffic calming features such as traffic circles to slow vehicles and enhance neighborhood character.

At the first phase the redesign of the intersection to increase capacity and to promote pedestrian and bi-Cyclist movement the redesign and signalization of the below intersection could be taken up.

<b>Sl. No.</b>	<b>Roundabouts/Rotary</b>
1	Guwahati Club
2	Narengi junction
3	Maligaon junction
<b>Sl. No.</b>	<b>Cross Junctions</b>
1	Fatasil Ambari
2	Gorchuk junction
3	Lokhra junction
4	Basistha Chairali
5	Sarabhati junction
6	Jalukbari junction
7	Beharbari junction
8	Ganeshguri junction
9	Bharalumukh junction
10	Kachari junction
11	Khanapara junction
12	Bahaita junction
13	Mandkata to Guwahati City
14	Narengi to Panikhaiti
<b>Sl. No.</b>	<b>Y - Junction</b>
1	Ulubari junction
2	Six miles junction
3	Goalpara Junction
4	9 <sup>th</sup> mile junction
5	Majirgaon junction
<b>Sl. No.</b>	<b>T - Junction</b>
1	Bhangagarh junction
2	Chandmari junction
3	Lal ganesh junction
4	Dadara Hajo



### **5.17.12 Transit Oriented Development (TOD)**

At present, like many other countries, India has a policy for namely National Transit Oriented Development (TOD). Transit Oriented Development is essentially any development, macro or micro, that is focused around a transit node, and facilitates complete ease of access to the transit facility, thereby inducing people to prefer to walk and use public transportation over personal modes of transport. (Source: Transit Oriented Development Policy) High density urban growth offers the opportunity for trip lengths to be short. It promotes a high level of accessibility for NMT. It fosters successful, financially viable PT, and enables cities to have low levels of energy use per person in UT. The Government of India would encourage Transit Oriented Development (TOD) with increased FAR along transit corridors with high density of population should form a part of planning.

TOD, or transit-oriented development, means integrated urban places designed to bring people, activities, buildings, and public space together, with easy walking and cycling connection between them and near-excellent transit service to the rest of the city. It means inclusive access for all to local and citywide opportunities and resources by the most efficient and healthful combination of mobility modes, at the lowest financial and environmental cost, and with the highest resilience to disruptive events. Inclusive TOD would promote long-term sustainability, equity, shared prosperity, and civil peace in Guwahati.

This is an Overlay Zone which provides opportunity for mixed use and high rise and high-density development along the public transport corridor. Local Area Plans, including measures for road widening, parking management and pedestrianization, shall be prepared for this Zone. If the line of this Transit Oriented Zone divides a Building Unit, the entire Maximum Permissible FSI shall be permissible for development, irrespective of the part of the Building Unit that is not in TOZ Zone.

The major element of TOD is a congregation of housing, jobs, shops, and other activities around PT stations/stops. The physical environment is often enhanced with wide sidewalks, an absence of surface parking lots and large building setbacks. Thus, TOD includes planning for:

- More people to live close to transit services and to use it
- A rich mix of uses within walking distance of a PT station/stop
- Pedestrian facilities and multi-modal connectivity with focus on moving people

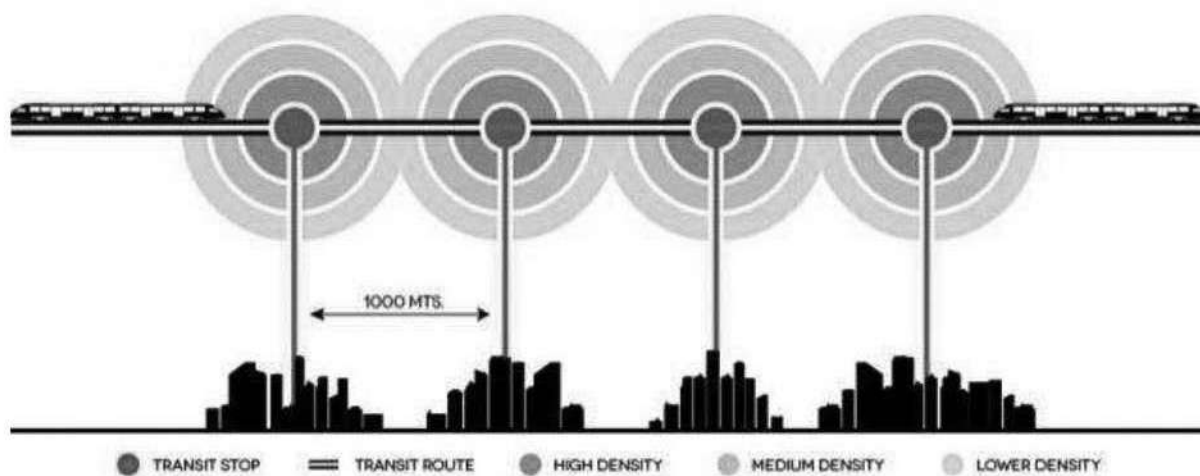
- Making PT station/stop a gateway to the community. Building bye-laws and planning norms should be revised for all cities so as to encourage high FAR and ground coverage along major PT corridors

#### **5.17.12.1 Basic principles of TOD are follows**

TOD integrates land use and transport planning and aims to develop planned sustainable urban growth centers, having walkable and livable communes with high density mixed land-use. Citizens have access to open green and public spaces and at the same time transit facilities are efficiently utilized

TOD focuses on creation of high density mixed land use development in the influence zone of transit stations, i.e. within the walking distance of (500-800 m) transit station or along the corridor in case the station spacing is about 1km TOD advocates pedestrian trips to access various facilities such as shopping, entertainment and work

#### **TOD along Transit station**



TOD increases the accessibility of the transit stations by creating pedestrian and Non-Motorised Transport (NMT) friendly infrastructure that benefits large number of people, thereby increasing the ridership of the transit facility and improving the economic and financial viability of the system. Since the transit corridor has mixed land-use, where the transit stations are either origin (housing) or destination (work), the corridor experiencing peak hour traffic in both directions would optimize the use of the transit system.

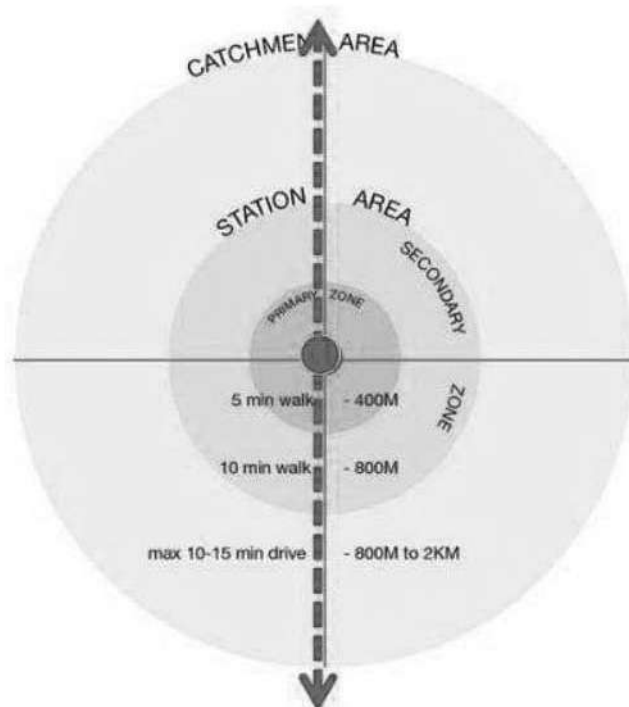
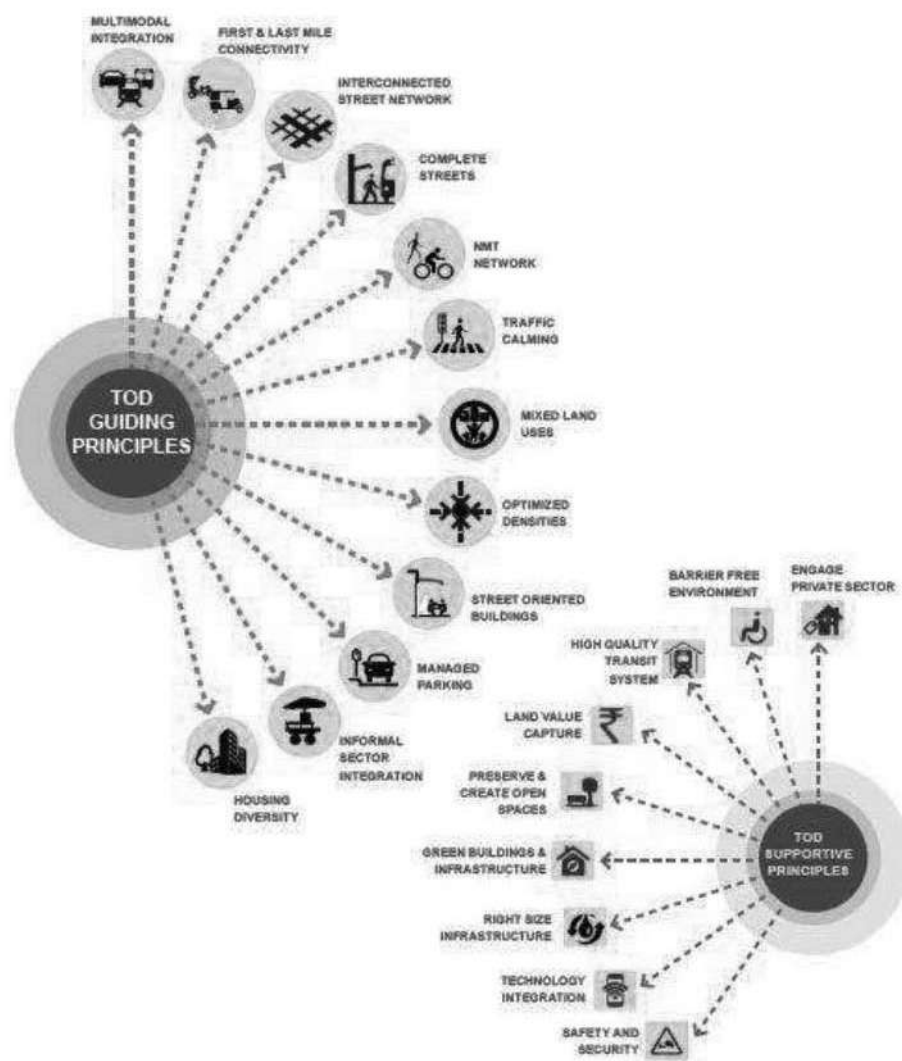
**5.17.12.2 Objectives of TOD Policy**

TOD integrates land use and transport planning to develop compact growth centers within the influence zone of 500-800 m on either side of the transit stations i.e. areas within walking distance, to achieve the following objectives

- To promote the use of public transport by developing high density zones in the influence area, which would increase the share of transit and walk trips made by the residents/ workers to meet the daily needs and also result in reduction in pollution and congestion in the influence area.
- To provide all the basic needs of work/ job, shopping, public amenities, entertainment in the influence zone with mixed land-use development which would reduce the need for travel.
- To establish a dense road network within the development area for safe and easy movement and connectivity of NMT and pedestrians between various uses as well as to transit stations.
- To achieve reduction in the private vehicle ownership, traffic and associated parking demand.
- To develop inclusive habitat in the influence area so that the people dependent on public transport can live in the livable communities within the walkable distance of transit stations.
- To integrate the Economically Weaker Sections (EWS) and affordable housing in the influence zone by allocating a prescribed proportion of built-up area for them in the total housing supply.
- To provide all kinds of recreational/entertainment/ open spaces, required for a good quality of life in the influence area.
- To ensure development of safe society with special attention to safety of women, children, senior citizen and differently abled by making necessary amendments to the building bye laws.

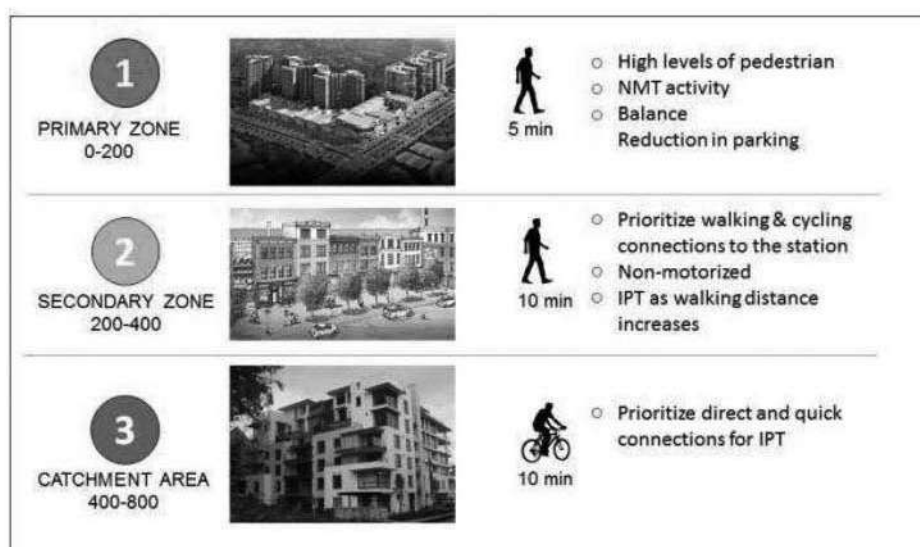
Though no mass rapid transport system has been proposed for Guwahati region and NH-27 for a depth of 200m have been earmarked for mixed commercial use, enabling implementation of TOD along these corridors.

### 5.17.12.3 *Principals of TOD*



#### **TOD Influence Zone:**

- **Enable Transformation** – Transformation from Private vehicle to Public Transport
- **Accessible Public Transport** – usage of public transport by making it accessible, by encouraging people to walk and cycle
- **Compact walkable communities** – To create livable and affordable communities



Guwahati is facing issues in delivering efficient, comfortable and affordable mobility options to its citizens. The current lack of connectivity to the public transportation systems, abundant subsidized parking options as well as lack of safety for walkers, cyclists and women in the cities has resulted in public transportation being relegated to second or even last choice of travel. This has consequentially resulted in the ever-increasing number of private vehicles plying in the cities. Guwahati needs to restructure and redefine how it works, lives and finds means of recreation. This is possible through Transit Oriented Development (TOD).

In order to promote compact transit oriented development in the city and to co-ordinate land use and transportation, Transit Oriented Zone is introduced. Transit Oriented zone is an effective tool to promote compact, transit oriented develop. within the walking distances of public transit routes such as BRTS and Metro.

This zone takes precedence over underlying Residential, Mixed use, Commercial and Public-Semi Public zones by encouraging compact mixed-use development. Sustainable transit-oriented densification could be achieved through incentivizing development of additional floor space along the transit corridors and station areas.

Sustainable transit-oriented densification could be achieved through incentivizing development of additional floor space along the transit corridors and station areas.

The provisions of TOD include:

- Development/ Redevelopment in TOD zone will be incentivized by providing significantly higher additional 40% on the maximum permissible FAR of the zone/plot, subject to a capping of maximum FAR of 400 on the entire amalgamated plot being developed/ redeveloped including all. However, maximum FAR in all the TOD zones shall not exceed 400.

Detailed calculation of additional FAR and break-up of maximum FAR allowed against different uses other details are given below:

For Transit Zone,

<i>Base FAR as specified in bye law</i>	<i>= A</i>
<i>Premium FAR as specified in Bye Law</i>	<i>= B</i>
<i>Additional FAR</i>	<i>= C = 40% of (A+B)</i>
<i>TDR FAR as per TDR Policy</i>	<i>= D</i>
<i>Total FAR allowed in TOD</i>	<i>= M = (A+B+C+D) which shall not exceed FAR 400</i>

**Note:** Additional FAR is allowed in plot more than 2000sq.m abutting a road of minimum 10m subject to maximum 400 FAR.

- Any FAR over and above the base FAR shall be treated as premium FAR and shall be charged at the rates as provided in the building bye-laws.
- Entire approved layout plan of a scheme will be included in influence zone if more than 50% of the plan area falls inside the influence zone.
- TDR shall be applicable to TOD zones for densification but shall be limited to FAR 400 in total.
- 20% of land shall be used for roads/ circulation areas. 20% area for green open space shall be kept open for general public use at all times. Further, 10% area of green area may be for exclusive use. In total 50% front marginal distance (subject to a minimum of 3 mtr) shall be kept accessible to the pedestrian. However, it shall be permissible for the applicant to construct/erect fencing on the receded boundary, after leaving the space for pedestrians as specified above.
- Wholesale stores, car dealer showrooms, warehouses, storages, auto service centres, Garages, etc. shall not be eligible for benefits under this TOD policy.
- Higher FAR permissible along the Transportation corridors and around the nodes as specified will not be allowed in area identified as Conservation Zone-1 mainly undevelopable and protective areas, even if these areas come under the TOD zone of Transport corridor or identified nodes.



- Computerized single window clearance system shall be adopted for approval of TOD projects.
- Increase in safety especially for women and children using public transport or walking at night shall be facilitated through changes in key Development Code aspects such as revised setback norms, dispensing with boundary walls, having built-to-edge buildings with active frontages which provide 'eyes-on-the-street', etc.

#### 5.17.12.4 Proposed TOD Corridors for Guwahati Planning Area

There are four TOD corridors proposed in Planning Area. **Corridor 1** is proposed from Khanapara to Jalukbari (NH 27). **Corridor 2** is proposed from Lokhra to Bharalu Mukh through Lokhra Road. It further continues towards North Guwahati up to NH 27 by crossing Brahmaputra River through new under construction bridge at Bharalumukh. **Corridor 3** is Khanapara junction to SH 3 towards Panikhaiti through VIP Road and Narengi junction. **Corridor 4** is Jalukbari Junction towards Goalpara through NH27 via Azara. **Corridor 5** is Amin Gaon to Suwalkuchi through NH 427 as described in fig 5-133. The identified 10 Transit nodes are, **Node 1:** Adabari, **Node 2:** Borjhar, **Node 3:** Lokhra, **Node 4:** Basistha, **Node 5:** Khanapara, **Node 6:** Narengi, **Node 7:** Abhoypur, **Node 8:** Near AIIMS, **Node 9:** Singimari and **Node 10:** Suwalkuchi.

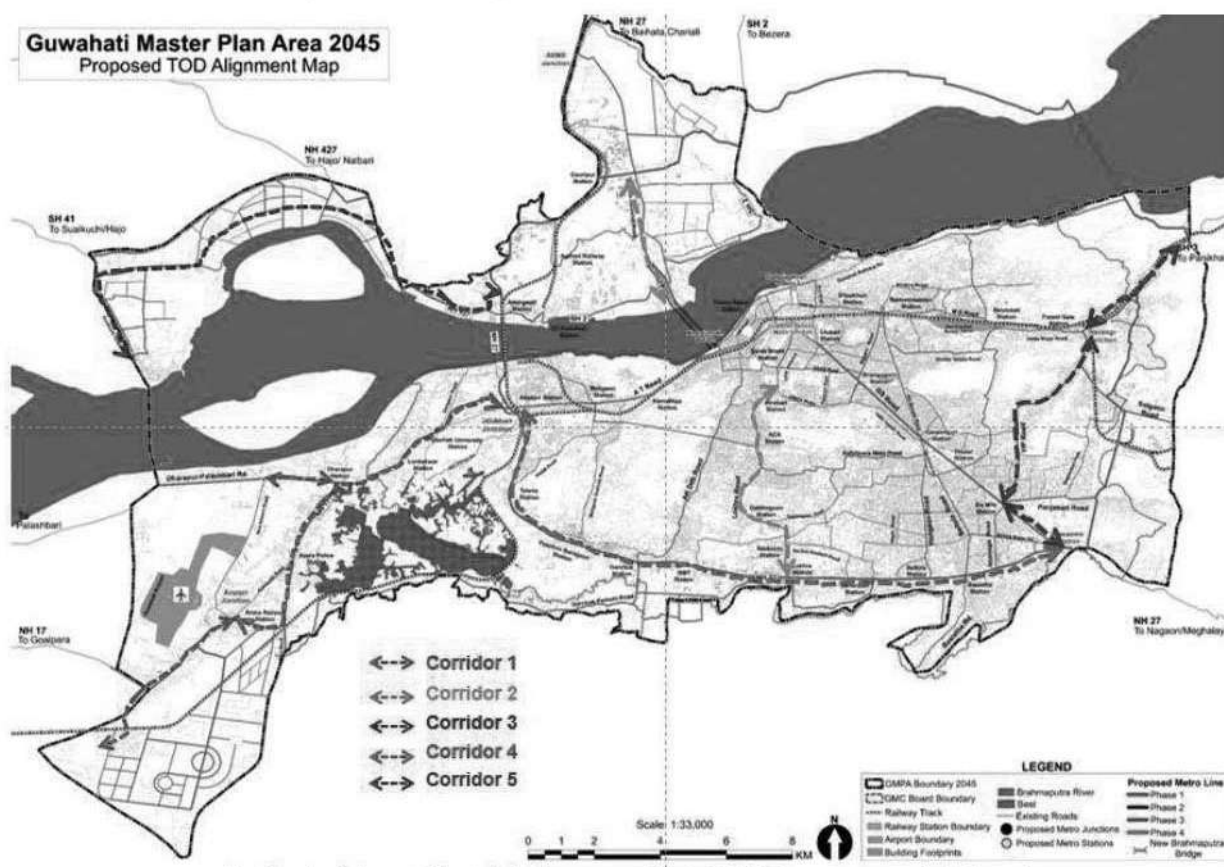


Figure 5-133 Proposed TOD Corridors

Mixed Commercial Zone is proposed along these corridors. The FAR in this zone is suggested to be 250. Apart from this, construction of Multi Story Buildings will be promoted. Hence, density of the surrounding area of the corridors will increase.

These corridors are proposed as Bus Augmentation Corridors under Comprehensive Development Plan for Guwahati due to which connectivity to surrounding locations will be increased. The proposed Multi Modal Logistic Park at Namati Jalah is located near the Corridor 2 shown in the map due to which the possibilities of availability of various mode of transportation will be increased. All these corridors are having Residential, Commercial, Mixed Residential Zone and Public & Semi-Public Zone along them. For these zones, maximum FAR is suggested to be 400 from 180 with maximum height permissibility of 45m from 15m. These zones will be densified due to such higher provision of FAR and height permissibility. Due to such various provisions, the use of Public Transportation will be increased along these corridors. Mixed use Development shall be promoted along these corridors.

#### **5.17.13 Public Transportation Proposal**

In this section, various public transportation systems adopted by different cities in the country are discussed and their feasibility and viability for Guwahati Planning Area is studied. This assessment is based on the projected population for plan period, proposed developments, decentralization principle adopted and the growth centers identified beyond the conurbation area.

Other key considerations which are assumed while assessing the choice for mass transit are the proposed road widening recommendations are implemented by the concerned departments and there is a shift in use of Public Transportation (PT) in place of private vehicles. Currently the PT share in Urban areas of the planning area is 10 % (Source: CMP Report) and which is not sustainable for the overall development of the planning area in a longer run. To achieve the visions set as part of the GMP 2045, which gives emphasis on better quality of life, better connectivity and to maintain an environment friendly means of transportation it's important to study the rail based and bus-based transit system suitable for the planning area. Recommending a particular mode of transit system for an area or corridor depends on the demand of PT in the respective area, available RoW, Land Use along the corridor, and future growth potential of the corridor. It is important to adopt a mode which will be adequate for future demand levels in both quantity and quality. Hence multi- modal systems which

integrates the existing PT system with proposed modes for a seamless journey to the commuters within the planning area is to be adopted.

#### **5.17.13.1 Metro Rail Transit System (MRTS)**

Metro rail is one of the most adopted rapid transit system. Kolkata metro being the first mass rapid transit system and Delhi Metro is the first modern metro introduced in the country. Recently, the Government of India has proposed to give assistance for metro rail systems to all cities with



more than 1 million population. This segment of rapid transit system is seeing huge growth in recent years due to the volume of passengers it can transport. To sustain an economically feasible metro or metro neo rail operations a minimum population of 2 million is required as per criteria specified for mode of selection of mass transport system by the National Transport Development Policy Committee, Government of India.

The projected population for the planning area is 3.8 million by 2045, hence metro rail option is feasible with projected figures as of now. Moreover, the authority can assess their feasibility in earlier upcoming years of the plan period understanding the growth and prevailing demand for mass transit.

As per the interim land use strategy based on adopted TOD model, the development focus should concentrate on proposed mixed-use high-density corridors. The public transit strategy thus focuses on development of a linear public transit corridor, along with other mass transit corridors feeding to it.

**Phase 1:** The existing AT road corridor will need to be upgraded to higher order mass transit corridor. This route would run west to east from Jalukbari to Narengi. The corridor will be approximately 25 km in length. It will run by connecting Jalukbari, Adabari, Maligaon, Kamakhya, Bharalumukh, Fancy Bazar, Digholipukhuri, Silpukhuri, Bamunimaidan, Noonmati and Forest gate.

**Phase 2:** This corridor will run north-south along the existing GS road from Digholipukhuri to Khanapara. The important stations proposed to be aligned along the

G.S. road would be Ulubari, Bhangagarh, Ganeshguri, Dispur and Six mile. The length of this corridor is 10 km.

**Phase 3:** This corridor will be along the existing major arterial road, which is NH 27, from Khanapar to AIMS. The important stations proposed to be aligned along the corridor would be Basistha chariali, Beltola, Beharbari junction, Lokhra junction, ISBT, Garchuk, Paschim baragaon, Tetelia, Jalukbari, Amingaon, IIT, Agthori Railway station, Gauripur Junction, AIMS.

**Phae 4:** In this phase two corridors will be taken up for MRTS development. One will be along the existing NH 17, from Jalukbari to LGBI Airport. The important stations proposed to be aligned along the corridor would be Gauhati University, Lakeshwar, Dharapur junction, Azara police Station, Azara railway Station. Another one will be along Lokhara road from Guwahati railway station to Lokhra Junction and the stations proposed to be aligned with would be Sarab Bhatti, Birubari, ACA road junction, Dakhingaon and Saukuchi.

All proposed MRTS routes with junctions and intermediate stations are well described in Figure 5-134 for better understanding.





### 5.17.14 On-street and Off-street Parking

As discussed above in subsection 5.16 Issues, presently there are 43 free parking space notified by GMC in Guwahati Planning Area. Due to the dire need of parking spaces, three Multi-Level Car Parking facilities were constructed at three different locations, but it observed low utilization of Multi-Level Car parkings.

However, considering the provisions of TOD model multiple streets are being proposed for paid on street parking to mitigate the parking demands in the city. Some of the possible off-street parking are also identified and mentioned in the below figure 5-134. Multi-Level Car parking are also suggested to be proposed on the existing site of New Guwahati Railway Station and LGBI Airport. Agthori Railway station and Azara railway station could also be considered after augmentation of the stations.

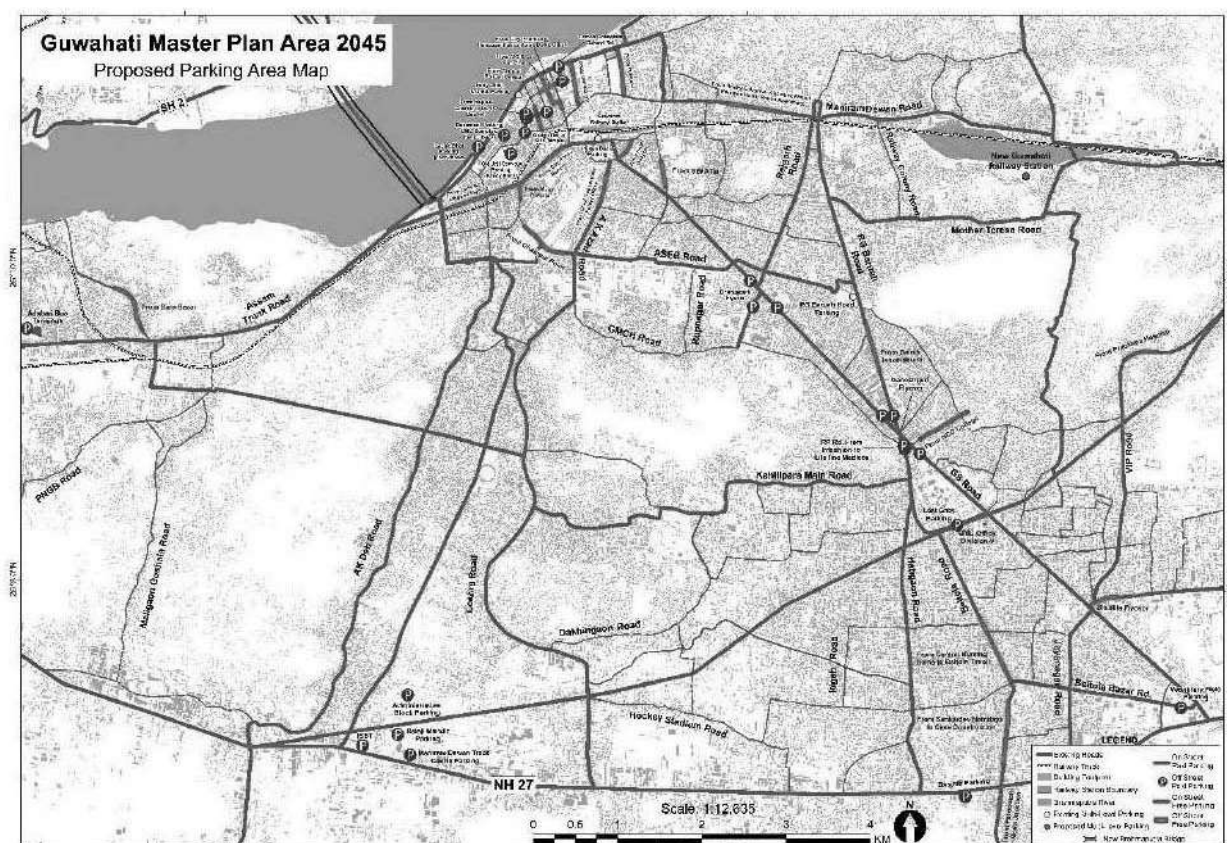


Figure 5-135 Proposed parking areas within GMPA



